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RURAL SECTION PUBLICATION—13.

(General Editor: W. H. MYLES, M.A.).

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I am compelled to begin this paper on Punjab Food Prices with a discussion of the extent of the general rise of prices in India as compared with that in other countries before the war. In his paper on Punjab Food Prices, 1861—1920, which appeared in the Indian Journal of Economics for July 1925, Prof. Myles has criticised my Essay entitled " A General View of Indian Prices " which, along with other essays, was published in book form in 1922. In that Essay I had tried to show that, before the war, prices were rising more rapidly in India than in other countries.

Prof. Myles's criticism may be summarized as follows :—

1. The year 1894 has been taken as the base for determining the extent of the rise of prices in India. The base is unsuitable.

2. The index numbers showing the rise of prices given by Datta in his *Enquiry into the Rise of Prices in India, Vol. I, p. 48* (average prices in the quinquennium 1890—94 being the base) have been reduced to the base year 1894 by expressing them as a percentage of the price in 1894. "This procedure is not altogether justifiable from the statistical standpoint."[1]

3. I have given two sets of index numbers of Indian prices in my book, and have compared both with Sauerbeck's index numbers for the United Kingdom. It is " natural to assume that things which are comparable with the same thing are comparable with one another."[2] When my second index number is reduced to the base

(1) Footnote (5), P. 9. (2) P. 9.

1894, and compared with the index numbers of prices in other countries "the rise of prices in India, far from being 'greater than in any other country of the world', is actually found to be less than in any of the other countries selected for purposes of comparison."[1]

I will examine these charges *seriatim*.

1. I have given two tables of index numbers on pp. 41 and 42 of my book. In Table I on p. 41, which Prof. Myles ignores, I took the year 1895 as the base year for all countries whose prices were compared. In Table II on p. 42, I took the year 1896 as the base for the United Kingdom, Germany, France and the United States, and the year 1894 as the base for India.

Why did I take a single year as the basis of comparison ?

It is necessary to explain here briefly how the Essay came to be written.

The first edition of my *Essays on Indian Economic Problems* was published in 1919. It contained an Essay entitled "Examination of the Report of the Rise of Prices", in which, accepting the conclusion of the Prices Enquiry Committee that prices before the war were rising more rapidly in India than in any other country of the world, I attempted to explain that the rapid rise of prices in India after 1905 was probably due to the inflation of the rupee currency. It is well known that the Prices Enquiry Committee took average prices in the quinquennium 1890—94 as the basis of comparison. I had quoted the index numbers of the Prices Enquiry Committee in my Essay. My book was reviewed in the Economic Journal, London, and the reviewer took exception to the period 1890—94 as the base, as European prices were not lowest in that quinquennium. European prices were lowest in the year 1896. Well, if in order to find the full extent of the rise in European prices before the war you take the year 1896 as the base for European countries, you must take the year 1894 as the base for India, for Indian prices were lowest in that year. That is what I did when I re-wrote my Essay for a foreign journal.[2] The year 1896 cannot be taken as the base for India, for as I stated in my Essay,

(1) P. 11.

(2) My Essay appeared under the title "Die Preisgestaltung in Indien" in *Weltwirtschaftliches Archiv*, Kiel, Band 17 pp. 226—248*.

on account of the famine of 1896-97, Indian prices were abnormal in that year. But at the same time I gave another table of index numbers in which a common base was taken for all countries, *viz.*, the year 1895.[1]

I could have, of course, reproduced in my Essay, published in 1922, the whole set of Datta's index numbers of prices with the quinquennium 1890—94 as base. But I had given them in the first edition of the Essays, and I took it for granted that they were generally known.

In any case it deserves to be emphasized that whether we take a single year as the base or a quinquennium, the rise of prices in India is found to be greater than in other countries. On page 50 of the Prices Report the rise of prices in India and other countries in 1907—11 is compared with 1890—94 and 1894—98 (the lowest level of prices in all the countries compared, with the exception of India, was reached in the quinquennium 1894—98). I reproduce the figures below:—

	Compared with 1890—94	Compared with 1894—98
India	40	40
Belgium	25	26
Germany	24	38
United States of America	20	38
Canada	19	31
Italy	14	24
Australia	13	20
France	12	26
United Kingdom	9	21
New Zealand	1	9

Prof. Myles would, perhaps, insist that a ten-year period, with a famine in it, should be taken as the basis of comparison. But the reasons against a ten year basic period, which appeared to the Prices Enquiry Committee to be conclusive, were also decisive for me. Mr. Datta says:

"The basic period selected for the enquiry is the quinquennium

(1) If the year 1895 is taken as the base for all countries, the rise of prices in 1911 is found to be as follows: India 156, United Kingdom 130, France 137, Germany 152, United States of America, 141.

1890—94. This is a typical or normal period unaffected by such circumstances as famine and unseasonal rainfall. It was impossible to find, during the period under investigation, any consecutive ten years some portion of which was not seriously affected by exceptional circumstances. It was, therefore, not practicable to select, as the Committee of the British Association recommended, a ten year basic period." [1]

Prof. Myles does not seem to accept the view that Indian prices before the war rose to a greater extent than prices in other countries. So far as I know he has not published any figures which upset my conclusion.

2. Prof. Myles objects to my reducing Datta's index numbers to the base 1894 by expressing them as percentages of the price in 1894. What I have done is this. Datta's index number of wholesale prices in India (gold) stood at 85 in 1894 and 147 in 1912. If 85 is taken as 100, the index number for 1912 becomes 173, which figure I set down in my table (base 1894) against 1912. Prof. Myles tells us that " this procedure is not altogether justifiable from the statistical standpoint ".

All that I have to say about the matter is that if my procedure is " not altogether justifiable from the statistical standpoint ", then some of the leading economists of America and Germany, a leading English journal devoted to statistics, and the Statistical Department of the Government of India do not know what is justifiable and what is not altogether justifiable from the statistical standpoint.*

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(1) Prices Report, p. 14.

* Irving Fisher, perhaps the greatest authority on index numbers, in his book *The Making of Index Numbers*, says :

" Sometimes it is convenient to make some other year than the base 100 per cent. Thus we might wish to translate the above series (100·00, 96·32, 123·68, 175·79, 186·70, all calculated on 1913 as a base) into proportional numbers with 100 in place of 186·70 for 1918. The series then becomes 53·56, 51·59, 52·51, 66·25, 94·16, 100·00.

" But this replacement of the awkward number 186·70 in 1918 by the more convenient number 100, and the proportionate reduction of the original 100 in 1913 to 53·56, does not really change the base from 1913 to 1918. 1913 is still the base, but the base number is changed from 100 to 53·56 ; for the base number is the number common to all the commodities. Evidently to change an index number for 1918 from 186·70 to 100 does not make each separate commodity 100. The commodities having before had 36 different numbers, the average of which was 186·70, will now have 36 different numbers, the average of which is 100. On the other hand, 1913, which before had every commodity 100, will now have every commodity 53·56 ; therefore 1913 is still the base. Thus we must sometimes

I draw Prof. Myles's particular attention to a footnote on p. 17 of *Index Numbers of Indian Prices*, 1919, (published by the Statistical Department of the Government of India). As will appear later Prof. Myles has probably never seen these index numbers. On the page indicated gold prices in India and foreign countries from 1890 to 1918 are compared with the level of prices prevailing in each country in the quinquennium 1890—94. To do this it was first necessary to reduce the index numbers of Indian prices on the basis of 1873 to the basic period 1890—94. How was this done? The index number in 1900 on the basis of 1873 was 116. This was multiplied by 100 and then divided by 101·4, the average of the five years' index numbers, 1890—94. 114 was thus obtained, which was the index number of silver prices for the year 1900, the average for 1890—94 being taken as 100.

The Prices Enquiry Committee of 1910 reduced the prices of other countries to the base 1890-94 in the same way. Mr. Datta says:

" It has also been necessary to compare the general rise of prices in various countries, by means of index numbers published by the statistical offices of the United Kingdom, Belgium, France, Germany, Italy, Canada, United States, Australia and New Zealand.

---

distinguish between the true base year and the year for which the index number is taken as 100. *After a series of index numbers has been computed it is very easy to reduce or magnify all the figures in proportion, or to make any year 100 which we choose (pp. 17-18; italics mine).*

That this method is very commonly employed may be shown by a few examples.

Dr. Rudolf Meerwarth, whose name as a writer on statistics is well known in Germany, in his book *Einleitung in die Wirtschaftsstatistik*, (Jena, 1920) on p. 249, first quotes the index numbers of the Economist, base 1845—50, and then reduces them to the base 1871, by taking the index numbers for 1871 as 100.

Dr. Karl M. Obenaus in his interesting book *Die Italienischen Wechselkurse Waehrend der Jahre* 1914—1919 (Wurzen, 1922) on p. 33, quotes the index numbers Italy, England, France and the United States, and then reduces them to the base 1914 by taking the index number for 1914 in each case as 100.

The *Statist* is guilty of the same practice. It publishes international wholesale index numbers of prices every month. First the published index numbers of prices of various countries are given, and then they are reduced to the base 1913 by taking the index numbers for that year as 100. The index numbers of Italy, extracted from the Statist of December 12, 1925, are reproduced below :—

WHOLESALE PRICES—ITALY.

Published Index Numbers		Expressed as Percentage of 1913
1913	126·0	100
1920	786·7	624·3
1921	727·6	677·5
1922	708·5	562·3
1923	724·1	574·6
1924	737·1	585

They have all been reduced to a base of 1890—94, *the average index numbers for which have been taken as 100*."[1]

I would also like to ask how Prof. Myles would proceed if, in comparing the rise of prices in India with that in other countries from 1890 to 1912, he had to change the base of the index numbers. Does he possess information about the actual prices of the commodities which enter into the index numbers of different countries from 1890 to 1912?

3. Table VIII, given by Prof. Myles on p. 10 of his paper is reproduced below :

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(1) Italics mine, Prices Report, p. 15.

INDEX NUMBERS SHOWING THE RISE OF PRICES

Table VIII given by Prof. Myles on p. 10 of his paper. (Indian Journal of Economics, Vol. VI, pt. I.)

Year	United Kingdom (Sauerbeck).	France	Germany	U. S. A.	India	The Writer's second index number of prices in India.	The figures in the previous col. reduced to a percentage of their price in 1894.
1	2	3	4	5	6	7	8
1894	..	..	..	..	1894	102	100
1895	..	..	..	..	=	104	102
1896	100	100	100	100	100	110	108
1897	101	102	103	99	141	113	111
1898	104	107	109	104	128	96	94
1899	111	116	114	112	127	96	94
1900	122	125	122	122	148	116	114
1901	115	118	117	120	141	110	108
1902	113	115	114	125	135	105	103
1903	113	118	121	126	130	99	97
1904	115	116	122	125	129	101	99
1905	118	118	125	128	141	110	108
1906	126	129	136	135	158	129	127
1907	131	136	146	144	162	137	134
1908	119	124	132	135	173	138	135
1909	121	126	137	140	162	124	122
1910	128	132	141	146	161	122	120
1911	131	141	154	142	164	129	127
1912	138	..	..	151	173	137	134

Mr. Datta's index numbers of wholesale prices (gold) have been reduced to the base 1894 in column 6. It will be seen that according to the figures given in column 6, prices in India in 1911 had risen to a greater extent than in any other country mentioned in the table.

In column 7, Prof. Myles has reproduced the second set of index numbers given by me on p. 52 of my book, and in column 8 he has reduced these index numbers (base 1873) to the base 1894. When figures in column 8 are compared with those in columns 2-5, the rise of prices in India is found to be less than in any of the other countries.

What is my second index number of Indian prices which, as is seen, when reduced to the base 1894, gives such a startling result ?

Unfortunately I did not state the source of these index numbers in my book, and for this I must bear the blame. But I must say that it is surprising that Prof. Myles should not have been able to recognise this famous series of index numbers as soon as he saw it. These are the index numbers of the Commercial Intelligence Department, originally constructed by Mr. J. A. Robertson.[1] *There is one and only one official series of index numbers which takes us back to the year 1861* (1873 equal to 100), and it is most remarkable that a teacher of economics in India, presuming to write on prices, should know nothing about it. I had quoted the whole series from 1861 to 1918 in my book, setting down 100 against 1873, without any change whatever.

These index numbers are *index numbers of silver prices.* On pp. 35—41 of my book I have compared these index numbers with Sauerbeck's index numbers of gold prices in England. This is certainly permissible. My object there is to compare the *general movement* of silver prices in India with the *general movement* of gold prices in England. It is *not a question there of the extent of the rise of prices* in India as compared with the *extent* of the rise of prices in England. It is obvious that when we wish to determine the *extent* of the rise of prices in India and gold using countries, India's silver prices must be converted into gold. It is for this reason that figures given by Prof. Myles in Column 8 of the table

(1) The complete series, with the source, was quoted on pp. 41-42 of the first edition of the *Essays* published in 1919.

on p. 10 of his paper are meaningless. He did not know what my second index number of Indian prices was, and he took no trouble to find out.* Starting from the assumption that "things which are comparable with the same thing are comparable with one another", he has reduced in column 8 of his table VIII index numbers of *silver prices* in India to the base 1894 and compared them with index numbers of *gold prices* in other countries. There is, of course, no objection to our comparing these index numbers, when converted into index numbers of gold prices, with the index numbers of gold prices in other countries, if we wish to know whether prices in India were rising more or less rapidly than in other countries. This has been done by the Government Department of Statistics. I reproduce below the table, with the footnote, given on page 17 of Index Numbers of Indian Prices, No. 996, published in 1919 :

* It would have been easy for Prof. Myles to ask me, as a friendly colleague might well do, about the source of my index numbers.

Gold Prices in India and Foreign Countries from 1890 to 1918, as compared with the level of prices prevailing in each Country in the Quinquennial Period 1890—1894.

Year.	India. Department of Statistics Unweighted.	India. Weighted.	India. Prices Enquiry Committee (Calcutta.)	United Kingdom. Economist	United Kingdom. Sauerbeck, now Statist.	Canada Department of Labour.	United States. Dun.	United States. Gibson.	France La Reforme Economique.	Australia Bureau of Census and Statistics.
1890-94	100 (39 articles) General index number.	100 (100 articles.)	100 (102 articles.)	100 (44 articles.)	100 (45 articles.)	100 (272 articles.)	100 (200 articles.)	100 (22 articles.)	100 (48 articles.)	100 (92 articles).
1890	116	110	113	104	105	106	98	95	104	117
1891	105	105	105	103	105	104	107	111	104	104
1892	98	103	97	99	99	99	98	99	97	102
1893	98	98	97	98	99	98	103	100	101	94
1894	85	84	88	96	92	93	94	95	94	83
1895	91	85	91	89	90	94	88	92	87	84
1896	101	98	96	92	89	89	85	74	85	102
1897	110	123	110	91	90	88	82	76	86	102
1898	98	104	105	91	93	92	87	84	92	99
1899	99	101	105	95	99	96	88	91	99	89
1900	118	119	118	112	109	104	93	97	106	99
1901	111	116	116	108	102	103	104	97	99	108
1902	108	106	111	100	101	105	111	117	97	116
1903	102	103	110	102	101	106	109	107	99	116
1904	104	100	111	104	102	107	109	105	99	98
1905	112	112	119	106	105	109	109	103	99	101
1906	132	132	134	111	112	115	114	109	109	105

continued on next page.

Gold Prices in India and Foreign Countries from 1890 to 1918, as compared with the level of prices prevailing in each Country in the Quinquennial Period 1890—1894.

Year.	India.			United Kingdom.		Canada Department of Labour.	United States.		France La Reforme Economique.	Australia Bureau of Census and Staistics.
	Department of Statistics Unweighted.	Weighted.	Prices Enquiry Committee (Calcutta.)	Economist.	Sauerbeck, now Statist.		Dun.	Gibson.		
1890—94.	100 (39 articles) General index number.	100 (100 articles.)	100 (102 articles.)	100 (44 articles.)	100 (45 articles.)	100 (272 articles.)	100 (200 articles.)	100 (22 articles.)	100 (48 articles.)	100 (92 articles.)
1907	140	140	139	117	117	121	117	111	116	113
1908	140	149	138	114	106	116	124	118	105	123
1909	126	134	128	106	108	116	122	129	105	110
1910	124	125	130	116	114	119	135	129	112	111
1911	132	130	131	116	117	122	126	124	118	111
1912	140	145	139	120	124	129	135	137	122	130
1913	146	152	147	128	124	130	132	127	120	120
1914	150	156	..	122	124	131	136	133	..	127

Note.—To convert an index number of silver prices to an index number of gold prices, the index number of silver prices for any year is multiplied by the rate of exchange for that year, and divided by the rate of exchange in the basic period. To convert, for example, the index number of silver prices for the year 1900, which was 116....to a gold basis with 1873 as the standard period (1873 equal to 100), 116 is multiplied by 15·973, the rate of exchange of the year, and divided by 22·351, the rate of exchange of the standard period, *i.e.*, the gold prices index number is 83.

In the above table the index number of silver prices in 1900, for example has been converted to a gold basis with 1890—94 as 100 or the standard period. It was necessary firstly to reduce the index numbers of silver prices on the basis of 1873 to the basic period 1890—94, *i.e.*, 116 is multiplied by 100 and divided by 101·4, the average of the five years' index numbers 1890—94. This is 114, and 114 is then multiplied by 15·973, the average rate of exchange in 1900, and divided by 15·4904, the average rate of exchange in 1890—94, *i.e.*, the index number is 118.

It will be seen that whether we take the weighted or unweighted index numbers of the Department of Statistics, or the index numbers of the Prices Enquiry Committee, the rise of prices in India is found to be greater than in any other country mentioned in the table.

PUNJAB FOOD PRICES 1841—1920.

On p. 44 of his paper (Indian Journal of Economics, Vol. VI, pt. I) Prof. Myles sums up his conclusions regarding the movement of food prices in the Punjab from 1861 to 1920. He believes that the general level of prices remained remarkably stable from 1861 to 1887, in spite of years of severe famine and years of plenty. In a footnote he draws attention to my conclusion that the prices of agricultural produce in the Punjab began to rise after 1860. He says:

"My observations, however, bring me to a conclusion diametrically opposed to that generally accepted, and which is arrived at in an entirely different way by Professor Brij Narain in his "Essays on Indian Economic Problems". In an Essay on "Prices before 1861" after a survey of different Settlement Reports, he comes to this conclusion:—"Prices continued to be low till about 1860, after which they began to rise. For the first two or three years after 1860 the rise was due to famine, as also in 1868-69, but *it is broadly true that after 1865 prices show a marked upward tendency*" (p. 60). Again on p. 67, he says, "To sum up, there are two chief features of the early history of our prices (*i. e.*, Punjab Prices), the heavy fall of prices in the first three years after the annexation of the Punjab, and the *gradual rise of price after 1860*". Again on the same page he speaks of "*the rise in the price of agricultural produce. . . .after 1860*". (The italics in each case are mine). The conclusion is arrived at after a review of various Settlement Reports. He finds himself called upon to account for this rise in prices. The phenomenon brought out by my statistical survey is the reverse of that stated above, *viz.*, the remarkable stability of the general level of food prices in the Punjab from 1861 to 1887."

It is obvious that when I say that the price of agricultural produce began to rise after 1860, *I am comparing prices after 1860 with prices before 1860*, and not with the average prices in the decennium 1873—82. It should be remembered that the Essay from which these passages have been quoted is entitled "*Prices before 1861*".

Prof. Myles's enquiry begins from 1861, and there is no reference to prices before 1861 in this paper. It appears to him that the price of food grains began to rise in the Punjab after 1887, and he, in part, accounts for it by connecting it with "the improvement of communications in the province, and the linking up of its markets with those of the west".[1] If he had examined food prices in the Punjab before 1861, he would have found that this influence began to work much earlier, and in fact the great rise in Punjab food prices began after 1861. Prof. Myles's paper creates a misleading impression in so far as it suggests that the rise in prices began after 1887, and that no rise in prices has to be accounted for before that year.

In the following pages I propose to show, first, that food prices in the Punjab before 1860 were much lower than the prices after 1860 and second, that between 1861 and 1887 food prices in the Punjab did not remain remarkably stable but showed a marked upward tendency.

My method of inquiry will be twofold. In the first place I propose to review the Settlement Reports relating to this period. Prof. Myles completely ignores them. The Settlement Officer may not be a trained economist. But he is a practical man, and when he examines price statistics he has a practical end in view. When a new settlement is made, and a higher assessment is proposed, the Settlement Officer must state his grounds for proposing it. Now the rise of prices is one of these grounds, and if we find a Settlement Officer justifying the higher assessment proposed on the ground that prices had risen, it is reasonable to assume that prices did actually rise, unless we can show that the Settlement Officer misinterpreted the facts. Now there are a dozen Settlement Officers working in different districts of the Punjab who refer to the rise of prices in this period. All of them cannot have been wrong, and we have to remember that their reports were written at the time when they were observing those phenomena, and not 50 years afterwards. If a Settlement Officer had arrived at a conclusion regarding the movement of prices in his district which was "diametrically opposed" to the known facts, he would have been inmediately checked and corrected.

(1) P. 45.

To the people of the province also, upon whom higher assessments were imposed in this period, the question of the rise of prices was a practical question. One may show by means of a smoothed curve that food prices remained remarkably stable from 1861 to 1887, but as we shall see, that was not the view taken of the movement of prices in this period by those who imposed higher assessments and those who paid them.

The verdict of the Settlement Officer, therefore, is important, and it cannot be lightly ignored because it conflicts with the tendency of the smoothed curve.

In the second place I propose to examine the statistical material given in the Punjab Administration Reports and the *Prices and Wages Reports*, and on the basis of it to show that Punjab food prices from 1861 to 1887 did not remain remarkably stable but were rising.

Jullundar District.

Mr. W. E. Purser, in his Final Report of the Revised Settlement of the Jullundar District, published in 1892, thus refers to the course of prices in his district:

"The general result was found to be that in the first decade after the Regular Settlement (completed in 1851) prices fell off greatly, but after that recovered, and have tended to rise higher and higher since"[1].

Mr. Purser wrote a note on prices in the Jullundar District from 1846 to 1882, which has been published as Appendix XII to the Assessment Report of Tehsil Nawashehar, 1883. He divides his statistics of prices into four periods of which the first extends from 1846 to 1861, "till the great rise in prices began"[2], to quote Mr. Purser's own words, and the second from 1862 to 1882. He regarded the returns of prices relating to the chief crops of the district, wheat gram, maize, cane, cotton and *moth* as "fairly correct". District averages for the principal food grains in quinquennial periods from 1846 to 1882 are given below:—

(1) P. 155.

(2) Appendix XII to the Assessment Report of Tehsil Nawashehar, 1883 Clvi, Para 1.

Seers per rupee.

	Wheat		Gram		Barley		Maize		Jowar	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1846-51	31	40	33	42	37	51	46	49	48	59
1851-56	48	58	64	76	64	100	63	81	62	56
1856-61	52	56	66	76	65	78	53	65	48	53
1861-66	30	38	40	48	40	58	43	47	38	38
1866-71	22	25	19	30	27	32	27	34	21	23
1871-76	26	33	33	39	32	42	34	39	30	34
1876-82	22	26	26	36	31	33	25	30	26	28

(a) Average prices of trade transactions.
(b) Average prices received by agriculturists.

In will be seen that prices in the quinquennia 1861-66 and 1866-71 were higher than in 1856-61 or 1851-56. Prices fell in 1871-76, but the level was still higher than in 1861-66. In 1876-82 prices were higher than in the preceding quinquennium, and much higher still than in the quinquennium 1861-66.

Average district prices from 1846 to 1861 (15 years) are compared below with the average of 21 years from 1862 to 1882:

Average Prices received by agriculturists. District averages

	1846-61	1862-82
Wheat	51	31
Gram	65	38
Barley	78	38
Maize	63	38
Jowar	48	28

Having these figures before him, it may well appear to Mr. Purser that the great rise in prices began after 1861. His remarks on the causes of price fluctuations are not without interest, and I am reproducing them in the footnote.†

† "The future of prices depends upon a number of social, political, and economic events concerning which I have not sufficient knowledge to form any trustworthy opinion, and the resultant forces of which I am quite unable to determine. Among the social circumstances affecting prices may be mentioned the increase of population and a rise in the standard of comfort here, both affecting the surplus produce available for export, which is practically that portion of the produce with which we are concerned. Among political circumstances the first rank belongs to the Eastern question and more especially to that part of it which concerns the safe and continuous navigation of the Suez Canal. A minor point is whether any domestic reforms would enable Russia to regain her old position of a great wheat exporter. But the most important question is an economic one,—Is the supply of the precious metals likely to largely increase or decrease? In the former case prices will fall, in the latter rise: other circumstances remaining the same. We know to our cost that the supply of gold is rapidly falling off. As to

Gujranwala.

The revision of the Settlement of Gujranwala district took place in 1889—94, and the Report was issued in 1894. Mr. (later Sir) M. F. O'Dwyer was the Settlement Officer. He tells us that the enquiry into prices was carried back as far as the year 1853, from which full statistics were available, with the view of determining not only the average Gazette prices, but the average harvest prices realised by agriculturists, which are more important for assessment purposes. The books of the leading traders at the chief centres in each tehsil were carefully examined, and unbroken series of prices of the chief food grains and agricultural produce were obtained. It was also found possible to discriminate between the prices in transactions between agriculturists and traders, *i. e.*, harvest prices, and the ordinary retail prices. The results of the enquiry are shown in the following table :—

Name of crop	Gazette Prices 1853—67	Harvest prices 1853—67	Prices assumed at Settlement 1867—68	Gazette prices 1873—88	Harvest prices 1873—88	Per cent of increase of col. 5 on col. 2.	Per cent of increase of col. 6 on col. 3.	Prices assumed for re-assesment.	Increase per cent. col. 9 on col. 4.	Average prices 1888-92	
										Gazette	Harvest
1	2	3	4	5	6	7	8	9	10	11	12
Wheat	32	36	34	20	24	60	50	26	3	18	21
Barley	54	55	51	34	38	60	45	40	27	23	31
Gram	47	49	41	27	33	75	49	35	17	25	27
Maize	39	47	40	26	28	50	68	32	25	20	23
Jowar	37	45	44	27	31	37	45	35	28	20	25
Bajra	..	..	35	..	..	..	..	30	17	..	..

[Prices in seers per rupee.]

silver, the most productive mines are apparently becoming exhausted. New mines may be discovered. But at present it would seem that the supply of gold and silver is by no means keeping pace with the increase in the world's trade. Another circumstance which it is difficult to classify as social, economic, or political, and in fact belongs in part to all these classes, is the rapid increase of population in the United States. This may imply a diminished power of export on account of the greater demand in the Eastern States for home consumption, or it may more

It should be noted that the prices assumed for re-assessment were substantially lower than the average prices in 1888—92, but substantially higher than the prices assumed at the Settlement of 1867-68.

"From these statistics it appears", says the Settlement Officer, "that the Gazette prices for the 15 years (1873—88) preceding this Settlement as compared with the Gazette prices for the 15 years (1853—67) preceding last Settlement show an increase of about 65 per cent. for Rabi and 40 per cent. for Kharif crops, while the harvest prices show an increase of 48 per cent. for Rabi and about 45 per cent. for Kharif crops. The value of the Rabi standing to the Kharif as 3 to 2 it follows that harvest prices for the latter period have risen 47 per cent. as compared with the former".[1]

The Settlement Officer points out that prices in 1873—88 were influenced by railway communication and the rise of the export trade. "Even if the latter influence", he adds, "be now considered a permanent one, and it is probable that every year England will look more and more to India for the supply of food grains——dearth owing to poor harvests will be rare in future owing to the greater area under cultivation and the increased security of outturn due to the canal".[2]

Amritsar District.

Mr. J. A. Grant, Settlement Officer, in his Final Report on Revision of Settlement (1888-93) of the Amritsar District, refers to the "sustained rise of prices, rent and letting value of land" [3] as one of the reasons for the enhancement of revenue. He compared average prices during 16 years ending with 1889 (excluding 1879) with average prices during 16 years ending with 1865 (excluding

probably imply a greater surplus available for export on account of the greater agricultural population of the Central and Western States; but in either case, it implies a removal to a greater distance of the place of production from the Europen market, and consquently less favourable terms of competition with India in that market. But against this must be set the serious efforts of the American Government to improve the interior water ways of the country so as to allow produce to be carried by water without breaking bulk from the Valley of the Mississipi to Europe. No such improvment is possible in India, which will have to depend on its very expensive railway carriage." Appendia XII to the Assessment Report (1883) of Tehsil Nawashehar, para (4).

(1) P. 51.

(2) P. 52. (3) P. 30.

1861), and estimated the rise of prices in 24 years, 1865—89, to be about 60 per cent. Objection was taken to Mr. Grant's comparing prices in 1850—65 with prices in 1874—89 in order to determine the extent of the rise of prices for purposes of assessment. The view taken by the Lieutenant Governor in his review of the Assessment Report of the Ajnala Tehsil 1892 (Amritsar District) was that the rise of prices which could be counted on for assessment purposes was not much over 30 per cent. Mr. Grant pointed out in his Settlement Report of Amritsar District that the Lieutenant Governor had considered the rise of prices up to the year 1877 only, and not during the whole period in which the rates assumed at the last Settlement worked.

It is not necessary for us to take part in this controversy. It is sufficient for us to note that between 1865 and 1877 the Lieutenant-Governor was prepared to assume a 30 per cent rise of prices as compared with the prices assumed at the preceding Settlement.

Jhelum.

Mr. R. G. Thomson in his Report of the Second Regular Settlement of the Jhelum District (1874—80) compares the average prices ruling in each Tehsil of the district from 1861—75 with the average prices of the period 1853—60, and thus comments on the result: "Comparing therewith (1853—60) the average prices ruling in each tehsil from 1861—75, it will be seen how much the incidence of the Regular Settlement, as it stood when first made, has been lightened by the course of prices during this period. Prices with merely temporary interruptions have moved upwards while the Land Tax has stood still.[1] Prices in Tehsil Jhelum are reproduced below :

In seers per rupee.

	Wheat	Gram	Bajra	Moth
1853—60	49	46	56	67
1861—65	34	31	36	44
1866—70	24	22	25	27
1871—75	28	25	35	41
1876*	36	50	46	45

The figures clearly show the rise of prices after 1861. Even

(1) pp. 109-112.

* 1876 shown separately in the Settlement Report.

in 1876, an year of exceptional plenty, all prices excepting that of bajra, were higher than the average prices in 1853—60.

The average prices in 1861 to 1875 are compared below with the average for 1853—60.

Seers per rupee.

		Wheat	Gram	Bajra	Moth
Pinddadankhan	1853—60	40	44	50	51
	1861—75	28	27	31	32
Jhelum	1853—60	49	46	56	67
	1861—75	29	26	29	33
Chakwal	1853—60	47	56	52	57
	1861—75	27	33	31	31
Talagang	1853—60	50	62	61	60
	1861—75	34	39	36	45

Ludhiana.—A very interesting note on the fluctuations of prices in the Ludhiana District from 1840 to 1879 written in 1880 by Mr. T. Gordon Walker, Settlement Officer, is appended to the Final Report of the Revision of Settlement of the Ludhiana District, 1878—83. The Settlement Officer accepts the following definition of a rise in prices given by Mr. Carpenter in a memorandum on the question of the variations of prices (Deccan Rents Enquiry). "A permanent rise, when it does occur, is not a clearly defined and tangible event taking place within a period of two or three years. It takes place through a series of fluctuations, the general level of the last fluctuation of the series being higher than that of the first." The object of the Settlement Officer was to determine whether any rise of prices in this sense had taken place in his district in the period 1840—79.

His detailed review of prices on the basis of price statistics for the four Tehsils of his district (figures for the Ludhiana Tehsil are given below) shows that during the ten years 1850—59 prices remained at a low level, falling steadily till the end of the period. "The period of five years 1860 to 1864," he says, "is one of transition, *prices being on the rise*." Bad seasons raised the prices of rabi 1860. Then followed failure of the autumn rains and loss of the harvests kharif 1860 and rabi 1861, resulting in a famine. Prices fell thereafter but, says the Settlement Officer, "*they never quite returned to their old position. From 1861 there is no tendency*

to return to the old level. There are oscillations, but they are over a higher line than before. If we exclude the scarcity year of 1869, we find that in Ludhiana between 1865 and 1877 the price of wheat varied between 37 and 28 and averaged 31. It is interesting to note the sudden recovery of prices after the scarcity of 1861-62 and the more gradual return after 1868—69 when the means of communication were more complete " [1] (*Italics mine*).

The following table extracted from the statement about prices, given by the Settlement Officer, shows the fluctuations in prices in Tehsil Ludhiana from 1850—54 to 1875—79.

Prices in Tehsil Ludhiana.

Seers per rupee.

	Wheat		Gram		Barley		Maize		Jowar	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1850-54	52	45	61	46	69	56	66	68	95	54
1855-59	63	59	84	87	83	97	75	73	94	83
1860-64	35	35	39	42	48	48	37	38	37	42
1865-69	27	27	34	33	38	37	31	32	35	34
1870-74	29	25	32	28	43	35	35	32	41	31
1875-79	28	24	33	32	38	37	30	26	32	27

(a) Prices paid to agriculturists.
(b) Harvest prices of traders.

The Settlement Officer's explanation of the causes of the rise of prices is given in the footnote.*

*" Into the causes of the general rise in the prices of agricultural produce throughout India we cannot here inquire. Had the district continued in a state of isolation, and the means of communication through it remained as imperfect as they were at the time of the Regular Settlement, there would still have been a rise of prices. But the improvement in communications is the principal cause which has operated to produce, or, at all events, has accentuated the rise in this district to the level of the last fifteen years. The opening of the Sindh, Punjab and Delhi Railway, which took place about twelve years ago, has, by extending the market for the produce of the district, once and for ever, we might say, brought up prices. The area of the district is only 1,378 sq. miles, and it is traversed by about 35 miles of railway and 125 miles of metalled roads. The principle that supply follows demand has been establishing itself in practice ; and nothing short of a decided fall in the value of agricultural produce all over India, and, we may add, Europe, will make prices recede towards their old level. The means of communication in the district are now so good that a demand in any part of India is at once felt throughout it and answered. Were prices to fall much now, it is pretty certain that a good deal of the wheat of the district would find its way eventually into European markets ; and the importance of wheat is much greater than its mere acreage denotes ; for it is the grain of export, and is cultivated on the best irrigated lands, which yield three times as much as unirrigated." (Para 13 of the Note or Prices appended to the Settlement Report, Ludhiana District, 1878—83).

(1) p. cii.

Shahpur District.—Mr. J. Wilson, Settlement Officer, made an enquiry into prices in this district in 1888. The results are summed up in the table given below. He found that in a series of years the averages for the different towns did not differ very much and he considered it sufficiently accurate to take their average as representing prices for the whole district. The harvest prices thus ascertained were as follows :—

Period		Wheat	Bajra	Jowar	Gram	Barley
Fifteen years	1850—64	41	47	52	51	57
Thirteen years	1865—77	26	30	34	32	38
Ten years	1878—87	21	25	28	27	31

He thus comments on these figures :—" Taking the average of the fifteen years, 1850—64, which cover the period of Settlement operations, as representing the prices of last Settlement, and the average of the last ten years as representing the prices now prevalent, it may be said that that quantity of each article which would then have fetched Rs. 100 in silver, now fetches as follows :— Wheat Rs 195, bajra Rs. 188, jowar Rs. 186, gram Rs. 189 barley Rs. 184. . . That is to say—*the principal food grains*—wheat, bajra, jowar, gram and barley, which together occupy three-fourths of the area under crops, *have each increased in money value more than 80 per cent. since last Settlement* and the price of wheat, which is by far the most important, has *practically doubled*" (italics Mr. Wilson's).[1]

We have reviewed in some detail the movement of food prices in Jullundar, Gujranwala, Amritsar, Jhelum, Ludhiana and Shahpur. My references to other districts will be briefer. No new facts are revealed by a study of other Settlement Reports relating to this period. The course of prices in the different parts of the province has been similar—low prices before 1861, and the gradual rise of prices after that year. It should be borne in mind that when a Settlement Officer speaks of the rise of prices in a given period as compared with another period, he is comparing average prices in the two periods, and not prices at the end of the period as compared with the prices at the beginning.

(1) Final Report on the Revision of Settlement of the Shahpur Dist. 1887—94, p. 9.

Ferozpore.—The Final Report on the Revision of Settlement (1884—89) of the Northern part of the Ferozpore District refers to about 45 per cent. rise in the price of grain since 1853-54 in the tract under Settlement (p. 9).

The Final Report on the Revision of Settlement (1889—91) of the Muktsar Pargana and Mamdot Jagir of the Ferozpore District refers to about 40 per cent. rise in the average prices of grain between 1872 and 1889 (p. 3).

In his Report on the first Regular Settlement of the Muzaffargarh District, 1873—80, the Settlement Officer, Mr. O' Brien, thus comments on the movement of prices in the Muzaffargarh District between 1854-55 and 1876-77:—"During the 23 years prices were lowest in the first five years, and rose generally during the next ten, falling again during the last eight years, but not so much as to reach the low prices of the first five years. Since 1877 prices have risen very much. Wheat is selling in 1881 at 13 seers per rupee" (p. 110).

Montgomery District.—In the Report on the Revised Settlement of the Montgomery District, published in 1878, Messrs. C. H. Roe and W. E. Purser, Settlement Officers, give statistics of prices in this district from 1838 to 1871. Their conclusions as regards the rise of prices are summed up thus:—

"The period of 15 years from 1842 to 1856 may be looked on as that the prices of which would have been regarded at last Settlement and the second period from 1856—71, as subsequent to last Settlement. The percentage of rise, in the second period, of average prices over those of the first period, is as regards—

Cotton	37 per cent.	China	37 per cent.
Jowar	28 per cent.	Wheat	37 per cent.
Rice	22 per cent.	Gram	15 per cent.
Kagni	39 per cent.		

"The tendency of prices since has been towards a fall. It is not likely that any serious fall will take place, while there are facts which make a further rise seem possible" (p. 155).

Mr. (later Sir) D. C. J. Ibbetson, in his Report on the Revision of Settlement of the Panipat Tehsil and Karnal Pargana of the Karnal District (1870—80) thus comments on the movement of prices in the tract under Settlement between 1850 and 1874:—

"The fifth period from 1850 to 1855, is marked by a sudden and extensive fall in all prices, which continued to 1858, and this must, I fancy, have been owing to the opening out of the Punjab, and to its surplus stuffs pouring into a market from which no railway existed to carry them away. The famine of 1859-60 only introduced the cotton famine, which began in 1861 and continued for five years, during which time it is estimated that £63,000,000 sterling of silver was poured into Bombay. This enormous addition to the circulation of the country drove up prices with a rush, and before equilibrium had been restored, the introduction of steam carriage from Delhi threw open the markets of the world to India, and perpetuated the high level which had been reached. The famine of 1869 created a temporary disturbance, but for the last five years the seasons have been fair, the opening of the Punjab Railway in 1870 has completed the connection between Lahore and Bombay, and prices have stood with an extraordinary steadiness at what may be considered their normal rates. Since then the drought of 1877—80 has again raised prices considerably; but the rise is probably only temporary" (p. 283).

Rawalpindi District.—The Final Report on the Revised Settlement of the Rawalpindi District 1880—87, by F. A. Robertson, Settlement Officer, thus refers to prices after 1860:—

"It seems undeniable that prices are both higher and better established than they were before the year 1860, and agriculturists have now far greater facilities for converting their produce into money than existed 30 years ago" (p. 143).

Gurdaspore District.—There was a Revised Settlement of the Gurdaspore District in 1887—92 by Mr. (later Sir) L. W. Dane. The difference between the prices assumed in 1865 and those assumed by the Settlement Officer in 1888, to quote his own words, was "enormous" (p. 39 of the Settlement Report).

The evidence of Settlement Officers regarding the movement of food prices in the Punjab after 1861 is important. It, at any rate, shows that I was not drawing upon my imagination when in my Essay on *Prices before 1861* I said that the prices of food grains in the Punjab showed a marked upward tendency after 1861. Any one who had this evidence before him would come to the same conclusion, unless he was misled by his smoothed curve.

Prof. Myles's conclusions regarding the movements of Punjab food grain prices during the whole period 1861—1920 are entirely based on the shape of his smoothed curve. It is seen that between 1865 and 1887 the smoothed curve is nearly a straight line, hence the conclusion that, in this period, the general level of the prices of food grains in the Punjab remained remarkably stable. Between 1887 and 1896 the curve is seen to rise, and between 1896 and 1905 the curve again becomes a straight line, from which Professor Myles concludes that the rise in the *general* level of food prices set in about 1887 and continued till 1896, after which stability set in which continued until about 1905.

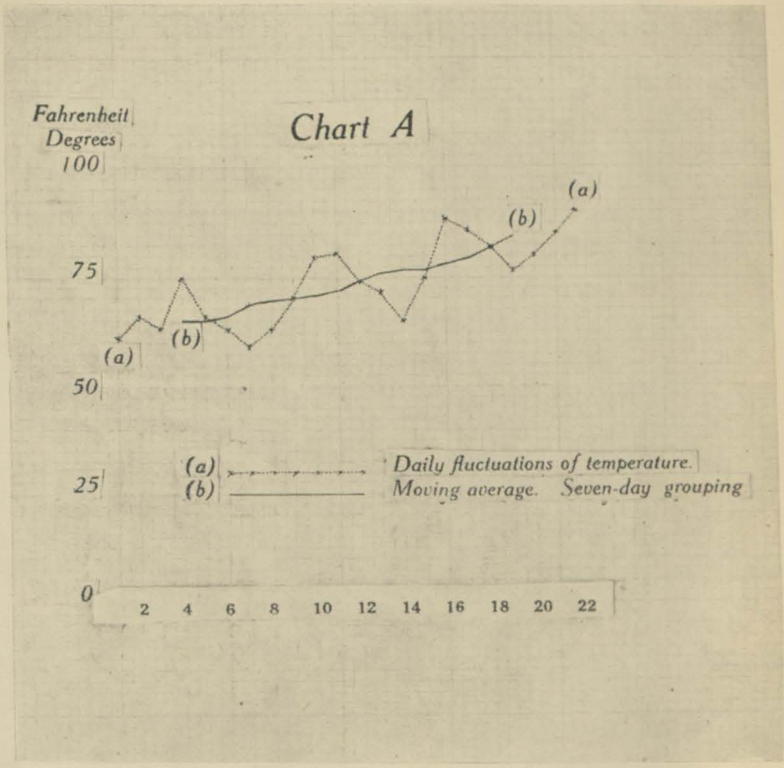
A smoothed curve, it should be remembered, is obtained in an artificial manner. It is useful for showing the general trend of a movement, but for no other purpose. It is never more important than the original data, and in interpreting it care should be taken that the meaning of the original data is not lost. Kelly says:—

"Since the average of two unequal numbers is never as large as the larger or as small as the smaller of the two, the smoothing process tends to flatten a curve out and lower modes. If the data are particularly irregular, it is frequently desirable to do this to reveal a general trend, but it should be borne in mind that something of significance is always lost in the process of smoothing. Numerical calculations should never be made from smoothed data, as a spurious consistency in the findings may be introduced and significance of the original data may be hidden"[1].

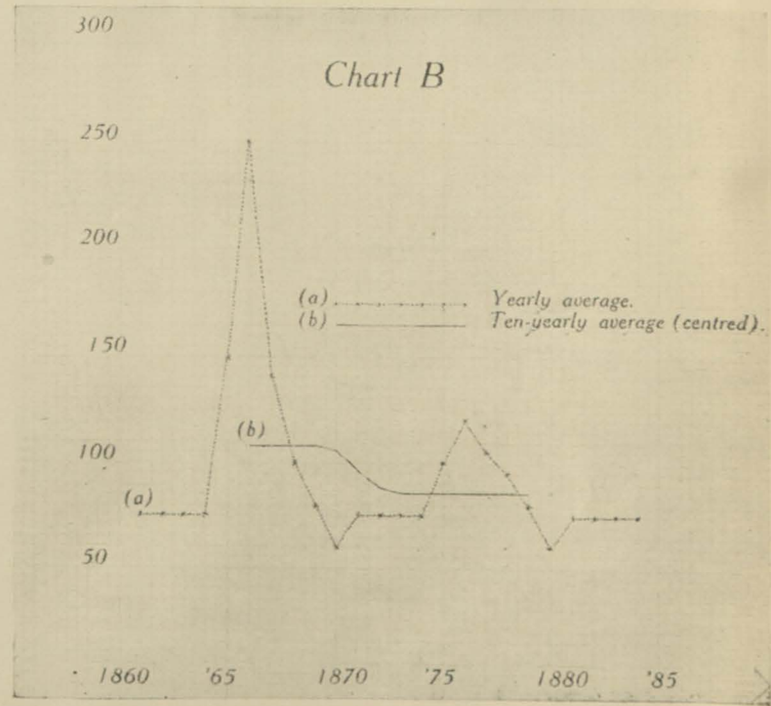
It deserves to be emphasized that smoothing may cause stability to appear where, according to the original data, there is none.

For example, suppose the yearly fluctuations of prices between 1861 and 1887 show that while during the whole period prices rose and fell, they never returned to the level of the average prices in 1862—66. In the process of smoothing this important fact may be overlooked, and yet this one fact would be a conclusive proof that after 1861 prices had a marked upward tendency. The stability of the smoothed curve in such a case would be ' spurious ' stability, which conceals the significance of the original data. The unwary statistician may thus eliminate not only yearly fluctuations but all sense from the data.

(1) Statistical Method by T. L. Kelly, p. 29.



Fahrenheit Degrees
Chart A
100
75
50
25
0
(a)
(b)
(a) Daily fluctuations of temperature.
(b) Moving average. Seven-day grouping
2 4 6 8 10 12 14 16 18 20 22



300
Chart B
250
200
150
100
50
(a) Yearly average.
(b) Ten-yearly average (centred).
(a)
(b)
1860 '65 1870 '75 1880 '85

Further, smoothing removes short time fluctuations. "**To study short time changes therefore**", as King says, "**the original historigram and not the trend must be studied**".[1]

Suppose the daily mean temperature of a certain place has varied in a month as shown in column 2 of the following table :—

February	Daily mean temperature. Fahrenheit in Degrees.	Moving average, 7 day grouping.
1	61	
2	66	
3	63	
4	75	65
5	66	65
6	63	66
7	59	68
8	63	69
9	70	70
10	80	71
11	81	72
12	74	74
13	72	76
14	65	77
15	75	77
16	88	78
17	86	79
18	82	82
19	77	84
20	80	
21	85	
22	90	

A moving average of 7 days shows the general trend (see Chart A). The curve rises steadily. But while the smoothed curve shows the general trend, it is no guide to the study of daily fluctuations of the mean temperature. They have been eliminated by means of the moving average, and no one is entitled to say that because the moving average rose from 72 to 77 between 11th February and 14th February, the general level of mean temperature

(1) Elements of Statistical Method by W. J. King, p. 171. This sentence is printed in thick type in the original.

was rising from 11th February to 14th February. The actual daily mean temperature, as is seen, fell from 81 degrees on 11th February to 65 degrees on 14th February.

We must take care not to confound the general trend with short time fluctuations. But this is exactly what we do when inferences are drawn about steadiness or unsteadiness of prices in particular years from the curve showing the general trend of prices. Suppose our prices between 1861 and 1884 rose and fell periodically in a cycle of ten years as shown in column 2 of the table given below :—

Year.	Index Numbers of prices.	Ten yearly moving average (centred).[1]
1861	75	
1862	75	
1863	75	
1864	75	
1865	150	
1866	250	108
1867	140	108
1868	100	108
1869	80	108
1870	60	106
1871	75	97
1872	75	88
1873	75	86
1874	75	86
1875	100	86
1876	120	86
1877	105	86
1878	95	86
1879	80	86
1880	60	
1881	75	
1882	75	
1883	75	
1884	75	

The ten yearly curve on chart B shows stability between 1866 and 1869, a fall commencing in 1870 and stability again between

(1) Centred by means of a two-yearly moving average.

1873 and 1880. The curve shows this, but any one who, looking at the shape of the curve, said that the general level of prices fell in 1870, or was stable from 1873 to 1880, would be wrong. Our original data show that nothing is farther from the truth. Between 1871 and 1874 prices were absolutely stable, and between 1874 and 1880 prices moved irregularly.

That it is wrong to infer from a smoothed curve that prices commenced to rise or fall in particular years may also be shown in another way.

When cyclical fluctuations take place about a uniform level, or about a line ascending with a uniform slope, the length of the cycle and the magnitude of the fluctuations being constant, a moving average having a period equal to the period of the cycle will give a straight line. The same result will be obtained when the moving average has a period which is a multiple of the period of the cycle. A twenty yearly moving average will show the same trend as the ten-yearly moving average, when the period of the cycle is ten years. This is shown by the table given below :—

Cyclical data	Ten yearly moving average (centred)*	Twenty yearly moving average (centred)*
20		
22		
26		
30		
36		
40	27·6	
32	27·6	
28	27·6	
24	27·6	
18	27·6	
20	27·6	27·6
22	27·6	27·6
26	27·6	27·6
30	27·6	27·6
36	27·6	27·6
40	27·6	27·6

* Centred by means of a two-yearly moving average.

Cyclical data	Ten yearly moving average (centred)*	Twenty yearly moving average (centred)*
32	27·6	27·6
28	27·6	27·6
24	27·6	27·6
18	27·6	27·6
20	27·6	
22	27·6	
26	27·6	
30	27·6	
36	27·6	
40		
32		
28		
24		
18		

If the magnitude of the fluctuations is not constant, the length of the cycle remaining the same (10 years), a twenty yearly moving average, while showing the same general trend as the ten yearly moving average, will give us a smoother curve *But the point of the greatest importance to which I wish to draw attention is that the two curves will not rise or fall precisely in the same years.*

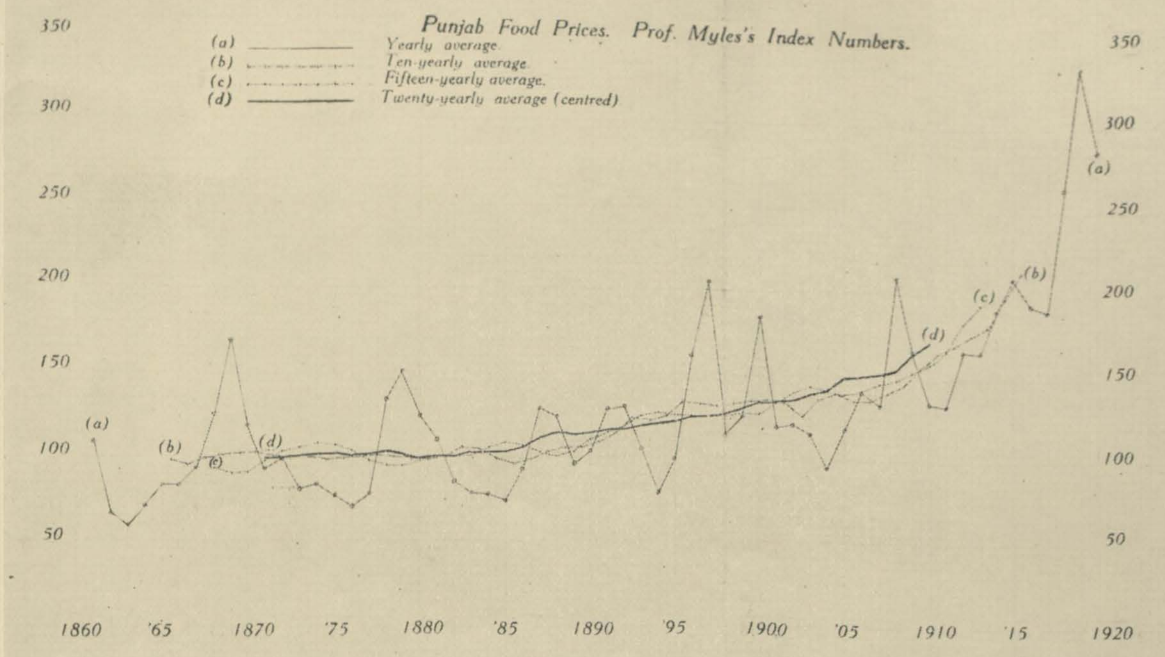
In Table V I have given in Column 2 Prof. Myles's index numbers of prices showing annual fluctuations, and in Column 3 his ten yearly average. Column 5 shows the 20 yearly moving average (centred). On Chart C the same data have been graphically presented.

It will be seen that the twenty yearly curve is smoother than the ten yearly curve. Further, it will be seen that the twenty yearly average rose steadily from 1880 to 1888, fell one point in 1889, and then rose continuously till the end. The ten yearly average, on the other hand, after rising in 1882 returned to the level of 1879 in 1886; rose from 1887 to 1896, and remained stable from 1896 to 1905.

Which of these two averages shall we trust as a guide to fluctuations in the general price level between particular years ?

*Centred by means of a two-yearly moving average.

Chart C



Punjab Food Prices. Prof. Myles's Index Numbers.
(a) Yearly average.
(b) Ten-yearly average.
(c) Fifteen-yearly average.
(d) Twenty-yearly average (centred)
350
300
250
200
150
100
50
1860
'65
1870
'75
1880
'85
1890
'95
1900
'05
1910
'15
1920

The answer is 'Neither.' By smoothing the curve we have eliminated yearly fluctuations. The general trend alone remains; individual years have disappeared from our view.

The moving average may rise or fall in a particular year not because of a rise or fall of prices in that year, but because of the influence of prices in the five or ten preceding or following years.

It thus appears that when we wish to determine the precise point of time when prices began to rise or fall, we must consult the original data, and not the general trend of prices as shown by the smoothed curve.

Price Statistics.

The prices of food grains (retail) from 1861 to 1920 have been taken from the well known official publication *Prices and Wages in India.* The 23rd issue published in 1906 gives the average annual prices of the five food grains, wheat, barley, jowar, bajra and gram, for the whole province from 1861 to 1905 in seers per rupee. The figures for 1906 to 1920 have been taken from the 36th issue, but it was necessary to convert prices given in rupees per maund into seers per rupee. I have preferred to give all prices in seers per rupee, as retail prices of food grains are commonly expressed thus in the Punjab and other parts of India.

The prices of wheat, barley, jowar and maize, from 1841 to 1860, have been taken from two diagrams showing the fluctuations in the prices of the chief articles of agricultural produce from 1841 to 1856, and from 1857 to 1874, given in the Punjab Administration Report for 1874-75. The diagram showing the fluctuations in prices from 1841 to 1856 has been repeated from the Punjab Administration Report for 1872-73. It is stated: "The prices shown in this diagram are calculated on the averages of 16 districts only, information regarding the remainder not being available for the years in question." The prices shown in the second diagram represent average prices for the whole province. The diagrams are clearly drawn, and no difficulty was experienced in interpreting them.

I should have preferred to get actual figures of prices, instead of having to read them from curves. But these figures were not available. I have, however, no reasons whatever to doubt the

accuracy of the diagrams, and the information which they give, is of value in *showing the general fluctuations in prices before 1861.*

It is not stated on either chart whether the prices shown are wholesale or retail. But they are not retail prices. When we compare the price of wheat from 1861 to 1874, as shown by the second diagram, with the retail price of wheat as given in the *Prices and Wages Report*, 23rd issue, we find that in all cases, except two, the prices as given in the *Prices and Wages* were higher:

Price of wheat in seers per rupee.

	As shown in chart II given in the Punjab Administration Report for 1874-75.	As given in the " *Prices and Wages*" *23rd Issue* (*retail.*)	Excess of the figures in Column 2 over the figures in Column 3.
1861	17·75	17·46	2 per cent.
1862	27·50	26·98	2 ,, ,,
1863	31·50	29·95	5 ,, ,,
1864	27·50	27·40	..
1865	23·00	21·73	6 per cent.
1866	23·50	22·83	3 ,, ,,
1867	22·50	21·07	7 ,, ,,
1868	18·50	16·24	14 ,, ,,
1869	14·25	11·99	18 ,, ,,
1870	16·00	15·84	1 ,, ,,
1871	21·50	21·08	2 ,, ,,
1872	20·00	20·40	..
1873	21·50	22·18	..
1874	24·00	22·95	4 per cent.

It will be seen that except in two cases, 1868 and 1869, (both famine years) the quantity of wheat obtainable per rupee, according to the diagram given in the Punjab Administration Report for 1874-75 was never more than 7 per cent. greater than the price (in seers per rupee) as given in the *Prices and Wages Report.* In order to make the price of wheat before 1861 comparable with the price since that year, I have reduced the figures for 1841—60 by 10 per cent. in each case. The prices thus obtained I have called "adjusted prices".

The actual retail price of wheat before 1861 may have been higher or lower than my adjusted prices; we have no means of determining this, and I am not basing any argument regarding the *extent* of the rise of prices after 1861 on my "adjusted prices". But

there is no objection to the use of these prices for showing *the general trend of prices* before 1861.

To determine the extent of the rise of prices between 1861 and 1920 I have used the average of prices in 1861—65 as the base. This is a fairly normal or typical period, excepting for the fact that the year 1861 was affected by famine. I did not wish to search for a basic period after 1870, when prices had already begun to rise. The decennium 1861—70 was rejected because it includes 4 years in which prices were abnormally high on account of famine (1861, 1868, 1869 and 1870).

It may be stated that the general trend of a prices curve would remain the same, whatever period of years was chosen as the base. But the extent of the rise of prices, when different years are taken as basic periods, is different. The average prices in 1861—65 are a better base than the average prices in the decennium 1873—82 for an enquiry whose object is to determine the extent of the rise of prices since 1861, *for average prices in* 1873—82 *were already* 26 *per cent. higher than in the quinquennium* 1861—65.[1]

It cannot be denied that the prices of food grains in the Punajb before 1861 were very low. The chief feature of the Punjab prices between the annexation of the province and 1861 is the great fall which occurred in the first three years after annexation, and which was the cause of no small amount of embarrassment to the Government. Between 1841 and 1850 prices were generally on a higher level than in the next decade. A sudden fall occurred in 1851, which made it difficult for cultivators to pay the land revenue. Fixed money assessments had been substituted for grain payments in 1847, but the prices assumed for the assessment of land were too high. "Collections became difficult"; says Mr. Prinsep, "I had to give large remissions; and from that date, 1851 till 1858, the effects of former high settlements were felt on all sides. In the Churkuree Mehal,

Note (1) The average prices were as follows :—

	Seers per Rupee				
	Wheat	Barley	Jowar	Bajra	Gram
1861—65	24·72	39·23	32·93	29·81	31·87
1873—82	20·15	30·17	25·91	23·34	25·77
The rise of prices in 1873—82 as compared with 1861—65	122·7	130·0	127·1	127·7	123·7

or an average rise of 26·2 per cent for the five food grains.

particularly, people absconded, wells were lying neglected and nothing short of immediate relief would have saved the irrigated tracts; and to give this the new assessments were more expeditiously brought about".*

The land tax was reduced everywhere "In the whole of the Punjab the reduction of the land tax may be estimated to be equal to 25 per cent., exclusive of any extras which may have been levied," says the General Report upon the Administration of the Punjab for the year 1849-50 and 1850-1851[1]. In spite of the reductions complaints on the part of the agriculturists were "loud and general". The chief cause of their distress was the fall in prices. Production had exceeded consumption, and there were no markets to which the surplus could be exported. The causes of agricultural distress are well analysed in the Administration Report for 1849-50 and 1850-51.[2]

A slight rise in prices took place in 1852 and 1853, but they fell again after 1856. Famine conditions prevailed in 1860-61 and prices rose.

Whether we compare the adjusted price of wheat in 1851—60 (Table I) with the price of wheat after 1861, or consider the prices given in the Settlement Reports reviewed above, it is unquestionable that prices in 1851—60 were much lower than the prices after 1861. We may disagree about the extent of the rise of prices after 1861 as compared with the decade ending in 1860, but the fact that prices before 1861 were lower cannot be denied.

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* Report on the Revised Settlement of the Sialkot District, 1862, p 56.

(1) p. 94.

(2) "For the three first years after annexation the harvests, with a few isolated exceptions, were remarkably favourable. For twenty years, the agriculturists declare, they had never witnessed such crops of wheat and barley. Not only did the unirrigated lands usually under cultivation yield a particularly large return, but cultivation was greatly extended. Lands which in ordinary seasons were seldom sown gave large returns. These circumstances, joined to the general peaces and security of the country and the fact that large bodies of disbanded soldiers and discharged employees had to turn attention to agriculture for a subsistence, all contributed to cause so great an increase of produce as to reduce prices to an unprecedented extent. The result of these different causes has doubtless been that production has exceeded consumption and hence that while an abundance of food exists, there is not a sufficient market to secure its sale at remunerative prices. No countries surround the Punjab to which any great quantity of grain could be exported To the west the disturbed estate of Afghanistan and the difficulties and cost of transit must prevent the export of food. To the south are Sind and Bhawalpur, the former producing more than it consumes, the latter a poor and thinly peopled tract. To the east is the Jullundar Doab, densely peopled, but so fruitful in its own soil as fully to support the inhabitants. To the north are the hills whose inhabitants have not the means of purchasing our surplus produce".

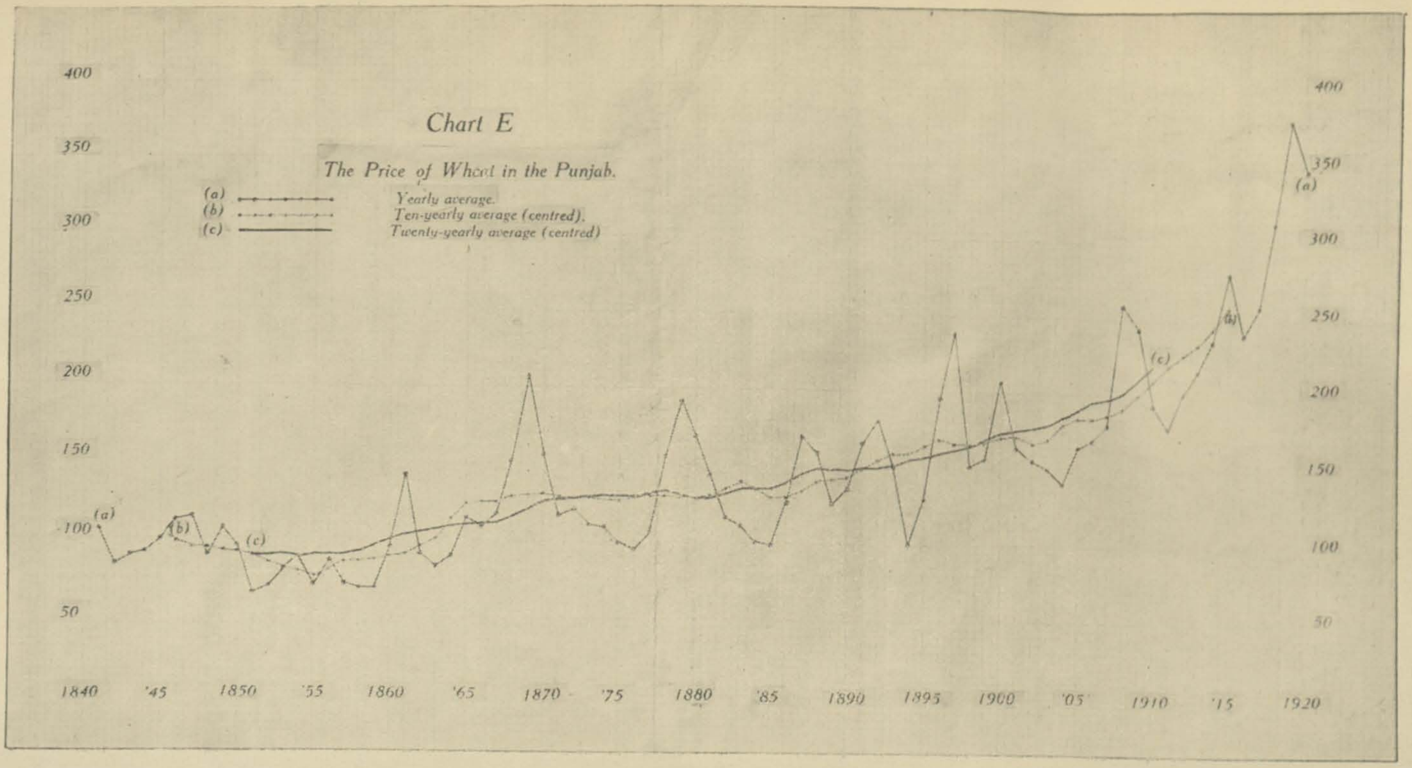


Chart E
The Price of Wheat in the Punjab.
(a) Yearly average.
(b) Ten-yearly average (centred).
(c) Twenty-yearly average (centred)
400
350
300
250
200
150
100
50
1840
'45
1850
'55
1860
'65
1870
'75
1880
'85
1890
'95
1900
'05
1910
'15
1920
(a)
(b)
(c)

Prof. Myles would probably admit this. But his main contention is that between 1861 and 1887 prices remained remarkably stable. How far is this true?

The table given below shows the lowest level touched by the average of the five grains in particular years or periods of years in each decade between 1861 and 1920:—

1861-65=100

Decade	Year of lowest prices	Index Number	Triennium of lowest prices	Index Number	Quinquennium of lowest prices.	Index Number
1861-70	1863	79	1862-64	88	1862-66	97
1871-80	1876	96	1875-77	102	1873-77	106
1881-90	1885	99	1883-85	102	1882-86	109
1891-1900	1894	105	1893-95	127	1891-95	147
1901-10	1904	130	1903-05	148	1901-05	154
1911-20	1911	182	1911-13	213	1911-15	238

It will be seen that prices were lowest in the decade 1861—70. They rose and fell in subsequent years, but they never returned to the lowest level touched in the decade 1861—70.

The annual average and the quinquennial average are seen to rise continuously, that is, in years of plenty in each successive decade they were higher than in the preceding decade. The triennial average in 1883—85 was the same (102) as in 1875—77, but the level was 14 points higher than the lowest level touched in 1862—64 (88).

We may next consider the fluctuations in the price of wheat, the grain of export. Wheat shows even better than the general average of the five grains the influence of the causes which began to raise prices after 1861. The following table shows the year or periods of years in which the price of wheat was lowest in each decade between 1861 and 1920:—

Decade	Year of lowest price	Price in seers per rupee	Index Nos. 1861-65=100
1861—70	1863	29·95	83
1871—80	1876	25·97	95
1881—90	1885	24·91	99
1891—1900	1894	24·21	102
1901—10	1904	17·75	139
1911—20	1911	13·87	178

Triennium of lowest price

Decade	Friennium of lowest price	Price in seers per rupee	Index Nos. 1861-65=100
1861—70	1862—64	28·14	88
1871—80	1875—77	24·70	100
1881—90	1883—85	23·83	104
1891—1900	1893—95	19·91	124
1901—10	1902—04	16·71	148
1911—20	1911—13	12·48	198
	Quinquennium of lowest price		
1861—70	1862—66	25·80	96
1871—80	1873—77	23·84	104
1881—90	1882—86	22·47	110
1891—1900	1891—95	17·64	140
1901—10	1901—05	16·08	154
1911—20	1911—15	11·34	218

It will be seen that the lowest price, whether annual, triennial or quinquennial, in each successive decade was higher than in the preceding decade.

These figures do not show that the price of food grains in the Punjab remained remarkably stable between 1861 and 1887 and comparatively stable between 1896 and 1905. The rise in prices is seen to be continuous, but the rate of increase is not the same in different periods.

It cannot be denied that a considerable rise of prices took place in the decade 1871—80 as compared with the decade 1861—70. The annual average index number of wheat stood at 95 in 1876 as compared with 83 in 1863 (the general average rose from 79 in 1863 to 96 in 1876). Between 1876 and the next year of plenty, 1885, the rise of prices was less rapid, 4 points in the case of wheat and 3 points in the case of the general average. The explanation of this is simple. The improvement of communications which enabled food grains to be exported from the Punjab even before 1870 led to a considerable rise of prices between 1863 and 1876. But prices tended to become steadier when this influence became of a more permanent nature—hence the less rapid rise of prices between 1876 and 1885. But it should

not be forgotten that between 1861 and 1887 prices were never remarkably stable. They were rising throughout this period, more rapidly at first and less rapidly later on.

This is what our original data show, and I maintain that when we wish to determine when prices began to rise or to fall, the original data alone must be consulted. The general trend is of no value for this purpose.

The twenty yearly average (of the five food grains) rose steadily from 134 in 1871 to 139 in 1878 and then fell to 137 in 1879 (Table III). But it would be absurd to say that the general level of prices fell in 1879 because the twenty yearly average was 2 points lower in 1879 then in the preceding year. We must not forget that the twenty yearly average set down against the year 1879 is the average price in the twenty years of which the year 1879 is only the middle point. While it is a link in the chain that shows the general trend of prices, it does not tell us anything about prices in 1879. As a matter of fact we know that prices in 1879 were abnormally high on account of famine, the index number of the average of the five grains having risen in that year to 205.

Similarly the ten yearly average fell from 136 in 1876 to 134 in 1879, while the annual average rose from 96 to 205. It will be again absurd to say that the general level of prices was falling from 1876 to 1879 when actual prices, as is seen, were rising under the influence of a very severe famine.

Even at the risk of being tedious I must repeat that we have no business to confound the general trend with short time fluctuations. The general trend is not meant to show when prices began to rise or to fall. And yet Prof. Myles's conclusions that the rise in the general level of food prices set in about 1887 and continued till 1896, and that comparative stability set in in 1896 and continued until about 1905, are entirely based on his smoothed curve.

The failure of prices in each successive decade to return to the lowest level touched in the preceding decade shows "a marked upward tendency" in the price of food grains after 1861. This interesting fact has been overlooked by Prof. Myles, as it has been smoothed out by his ten yearly average and free hand curve. But it is obvious that if in spite of years of plenty, the general level of food prices had

as is claimed by Prof. Myles, remained remarkably stable between 1861 and 1887, prices in good years in 1871—80 and 1881—90 would have returned to the level of good years in 1861—70. But they did not do so, showing that prices were tending to rise. Prof. Myles's conclusion is " diametrically opposed " not only to my own conclusion, but it is also " diametrically opposed " to truth and good sense.

The most important cause of the failure of prices to return to the old level after 1871 was the development of communications. Prices tended to become more and more independent of local conditions as the Punjab became more and more closely connected by means of the railway with other Provinces and the ports.

I may say a few words here about railway construction in the Punjab. Prof. Myles refers us for a short summary of the progress of railway construction in the Punjab to Mr. Calvert's " Wealth and Welfare in the Punjab ", and it would seem that Mr. Calvert has misled Prof. Myles. Mr. Calvert's account is a summary of a note on railways in the Punjab Administration Report for 1911-12, with one addition. Mr. Calvert says :—" Through communication with Calcutta and Bombay was established in 1883 " (p. 53). Of course the Punjab Administration Report for 1911-12 says no such thing.

As early as 1865 passengers and goods could be booked through between Amritsar and Karachi *. Through communication between the Punjab and Calcutta and the Punjab and Bombay was established in 1870**.

* " By arrangements concluded between the Traffic Managers of the Sind and Punjab Railways, and the Superintendant of the Indus Flotilla, passengers and goods can now be booked through between Amritsar and Karachi " (Punjab Administration Report for 1864-65, p. 85).

** " A section of Railway between Jalandhar and Phillor, 24 miles in length, was opened on the first day of the year. On the same date arrangements were introduced by which goods might be booked between all the principal stations from Calcutta to Karachi over the only remaining break in the line which then existed, viz., between Phillor and Ludhiana. These through booking arrangements were, on the whole, successful, and greatly facilitated the traffic between the Punjab and the seaboard so long as this interruption in the through communication remained.

" The last section of the line between Phillor and Ludhiana, including the Satlej Bridge, was thrown open to public traffic on the 15th of October, the opening ceremony being presided over by His Highness the Maharajah of Patiala. The opening of this section practically completed the construction of the Railway, and threw Lahore and Calcutta into direct railway communication " (Punjab Administration Report for 1870-71, p. 80).

" The through booking arrangements introduced on the first day of the year 1870 were still further extended, and passengers and goods can now be booked from stations on the Punjab and Delhi Railway to Madras, Bombay, Baroda and Ahmedabad " (Punjab Administration Report for 1871-72, p. 134).

Any one who knew that would be surprised if he did not find an upward tendency in the prices of food grains in the Punjab after 1865. But any one who thought that through communication with Calcutta and Bombay was not established before 1883 might well look for a rise of prices, owing to the improvement of communications, only after 1883.

The influence of the export trade in keeping up prices is referred to in several Administration Reports of this period. The earliest reference is in the Administration Report for 1865-66, where the " steady increase " in the price of wheat is ascribed to increased demand and " the opening out of new markets ".[1]

The Punjab Administration Report for 1871-72 thus comments on the connection between prices in the Punjab and other Provinces :—

" There can be no doubt that the prosperous grain harvest of 1871-72 in the North-Western Provinces made prices easier in the Punjab ; when there is a demand for grain in other Provinces, the Punjab prices always rise, even though the supply be abundant " (p. 152).

The spring crop of 1873-74 was " a most abundant one ", but according to the Punjab Administration Report for 1873-74, " the effect of this on prices was to a considerable extent counterbalanced by the extraordinary export of food grains to the Bengal famine districts ". Between 15th November 1873 and the end of March 1874, 3,296,783 maunds of food grains were sent from the Punjab to Bengal :—

(1) " Under the Sikh rule if, in the large cities of the Punjab, wheat was selling at a maund for the rupee it was considered rather dear than otherwise. Under British rule prices have rarely fallen so low, and during the past year at Lahore, Multan and Amritsar, wheat has sold at higher prices than when famine was last raging in the North-Western Provinces. This steady increase of prices, which was also noticed in the last year's report, is due not so much to the deficiency of the supply but to the increased demand, and to the opening out of new markets. Under the Sikh rule the badness, and the insecurity of the roads, and the levy of vexatious transit and customs dues prevented the exportation of grain to any considerable distance. Now the products of the Punjab find their way in large quantities beyond the Province. The quantities of ghee which are now exported from the Punjab to Sukhur, and even to Bombay, have had a marked effect in increasing the price of this commodity. The impulse given by the Punjab Railway to the despatch of goods is clearly shown by the traffic returns and also from the fact that during the last four months of the official year, 25,121 maunds of refined and 1,13,928 maunds of unrefined sugar were carried from the three stations of Amritsar, Lahore and Raewind". Punjab Administration Report, 1865-66, pp. 91-92.

	Maunds
Gram	646,725
Barley	647,375
Wheat	594,788
Rice	175,649
Indian corn	213,457
Millets	707,211
Pulses and other food grains	311,578

This " great drain on the resources of the Province " prevented prices on the 1st of June, 1874, from falling below the level of prices at the same period of the preceding year (pp. 57-58).

The Punjab Administration Report for 1875-76 finds it " more difficult to given reasons for (price) fluctuations, owing to the wider scope of enquiry necessary to determine them ", prices having become more and more independent of local circumstances on account of the development of communications (p. 70).

The Punjab Administration Report for 1876-77 refers to the " great demand for export to the famine districts of Bombay and to Europe " in the case of wheat in 1876-77. That the price still fell was due to a plentiful supply in the Province. " Wheat ", the Report adds, " is grown chiefly for sale and export, the agriculturist ordinarily subsisting on the cheaper grains " (p. 82).

Finally the Punjab Administration Report for 1886-87 thus comments on the export of wheat and its effect on the price of wheat : " It is believed also that much of the surplus stocks of wheat have been taken out of the country for export during the last few years. The absence of such stores would, in a period of scarcity, contribute to the general rise in the prices of food grains " (p. 81).

What has been the course of prices after 1887 ?

In 1887 and 1888, as well as in 1891 and 1892, prices were high on account of scarcity. In 1894 the index number showing the average annual price of the five food grains (1861-65 equal to 100) fell to 105 (the lowest level touched in the decade 1881—90 was 99 in 1885). But it commenced to rise immediately. Prof. Myles thinks the general level of food grain prices remained stable between 1896

and 1905. By the general level of prices he only means the free hand smoothed curve. But the curve again gives us an entirely misleading idea of the movement of prices in this period. The original data show no stability. It is obviously absurd to speak of stability of the general level of prices in a period which witnessed two severe famines. The average price of the five grains rose to 280 in 1897 and after falling to 172 in 1899 it rose to 251 in 1900. Even if we ignore the rise in prices due to famine, we cannot get over the fact that in 1904, the index number stood at 130, which was 25 points higher than the level touched in 1894. It is thus seen that prices between 1896 and 1904 did not cease to rise.

The general index number rose from 130 in 1905 to 227 in 1913 While the prices of food grains in the Punjab show an upward tendency throughout the period 1861—1905, the pace was never so rapid as after 1905. Under the influence of scarcity the index number rose to 287 in 1908, but even when normal conditions returned, it never fell below 182. The period of famine prices without famine began in 1905 and continued till the end of the period under enquiry.

Causes of the rise of Prices

Reference has been made above to the influence of the development of communications on the prices of food grains in the Punjab between 1861 and 1887. Another cause of the rise of prices was the increase in the circulation of money. In the Report on the Revised Settlement of the Shahpur District, dated 1866, "the large influx of silver from Europe now going on" is mentioned as one of the causes of the rise of prices (p. 89). Similarly the Settlement Officer of Karnal District (1872-80) draws attention to the effect upon prices of the heavy imports of silver into India during the Lancashire cotton famine.[1] This was a cause operating throughout India. But after the Mutiny money was more plentiful in the Punjab for special reasons. Before the Mutiny the Indian portion of the army employed in the Punjab was largely Hindustanee. A considerable share of the Punjab revenues was paid to them as their wages, of which they spent a part in the Punjab, and remitted the remainder to their homes.

(1) Settlement Report, Karnal Parganah and Panipat Tahsil, (1872-80), p. 283.

Many lakhs of rupees were thus annually drained from the Punjab. After the Mutiny the soldiers from Oudh were replaced by Punjabees; many thousands of Punjabee soldiers were also serving abroad. "These men", says the Punjab Administration Report for 1856-57 and 1857-58, "not only remit their savings, but also have sent quantities of prize property and plunder, the spoils of Hindustan, to their native villages" (p. 23).

The increase in the cost of cultivation must have also played some part in raising the prices of agricultural produce. Some Settlement Reports give the prices of plough cattle and agricultural implements, which show that costs of cultivation were much lower before 1860 than in the period subsequent to that date. The price of a plough bullock in Kot Khai (Simla District) was Rs. 5 in 1849 and Rs. 10 in 1883. The price of a bullock in Jehlum, Pind Dadan Khan, Chakwal and Tallagung at different dates is shown in the following table:—

	At the end of Sikh rule.	1858	1877
	Rs	Rs.	Rs.
Jehlum	25	40	55
P. D. Khan	15 to 30	30 to 40	20 to 90
Chakwal	11	16	45
Tallagung	15	22	26

The Settlement Officer, Karnal District, attached considerable importance to the rise in the cost of cultivation as an explanation of the rise in prices in his district.[1]

In the Report of the Second Regular Settlement of the Gujrat District (published in 1874) prices of agricultural implements during the Settlement are compared with prices in Sikh times, and it is found that the total had increased from Rs. 72-10-9 to Rs. 97-8-6.[2]

(1) "The price of cattle has probably doubled since 1840; at any rate that of the more valuable cattle which are needed for working the deep well and still soil of the Bangar and Nardak, and which are for the most part not bred at home. And if the people are to be believed the cost of all implements of agriculture has increased in almost like proportion. The demand for fuel and the extension of cultivation have rendered the materials dearer, the enhanced cost of living has raised the price of labour and the tendency which has so strongly marked our rule of late years to substitute contract for status and competition for custom has, in some not inconsiderable measure, relaxed the customary obligations which bind the village labourers and artificers to the communities among whom they dwell". He also pointed out that the extension of cultivation had led to the substitution of stall feeding for grazing and that the price of water had increased since 1842 by (150) per cent. (Settlement Report, 1872—80, p. 284).

(2) p. 85.

Captain Dunlop-Smith, Settlement Officer Sialkot District, (1888-95), thus refers to the rise in the cost of cultivation in the Sialkot District:—

"Again while prices have admittedly risen, there has heen steadily going on an advance in the cost of cultivation and the cost of living. This has been nowhere more marked than in the case of farm cattle".[1]

It has heen argued by some economists that the increase in the cost of cultivation is the result, and not the cause of the rise in the price of agricultural produce in India. The right view, however, seems to be that the rise in the cost of cultivation is a cause as well as an effect, and that the rise in price and the increase in the cost of production mutually influence each other. The extension of cultivation after 1860 led to an increase in the demand for labour, plough cattle and agricultural implements, and their prices rose. The price of agricultural produce also rose, the rise being partly due to the increased cost of cultivation.

We have seen that with the development of communications the influence of local circumstances in determining a rise or fall of prices began to decrease. As soon as wheat began to be exported from the Punjab to other parts of India and to foreign countries, the price of wheat and other food grains in the Punjab began to fluctuate in sympathy with price fluctuations in India and other countries. Our enquiry thus becomes wider. To explain why the price of food grains in the Punjab rose gradually up to 1905 and more rapidly between 1905 and 1920 we must examine the influences that were acting on the price of food grains throughout India. It would be absolutely futile to seek to establish a connection between the price of food grains in the Punjab and the quantity of money in circulation in the Punjab. This is an influence of a general nature, and if it was at work in India, Punjab prices could not have remained unaffected.

Table VII, Col. 2, shows the fluctuations in the retail price of wheat in India (base 1873). These are the Index Numbers of the Commercial Intelligence Department. For purposes of comparison it was also necessary to reduce the Punjab price to the base year 1873.

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(1) P. 36. Settlement Report, (1888-95).

Chart D shows the fluctuations in the price of wheat in the Punjab and in India between 1861 and 1920. It is sufficient if we study the price of wheat alone, for the rise and fall in the price of wheat closely corresponds to the rise and fall in the prices of the other food grains.

The general movement of the two curves on Chart D is similar, though the extent of the rise and fall in both cases is not the same. It will, therefore, be legitimate to assume in the present case that the causes which explain the fluctuations in the price of wheat in India also explain the fluctuations in the price of wheat in the Punjab.

The influence of increased exports in raising the price of wheat in India may be shown by a few examples.

Indian wheat does not much compete with wheat grown in Russia, United States, Argentina and other wheat growing countries; it is required in foreign countries only to supplement deficiencies. " Apart, therefore, from general conditions, affecting the supply," says the Report on the Inquiry into the Rise of Prices, " exports are subject to violent fluctuations arising out of variations in the supply of other countries. In one year the demand will be very large and even if the Indian harvest is abundant, prices will rise ; in the following year, the foreign demand may be largely reduced owing to abundant supplies from Russia, the United States and other exporting countries, and even if the harvest in India be deficient, prices might fall. The European demand, therefore, excercises a very important influence on the price of Indian wheat."[1] This may be shown by a few examples. In 1891 the wheat harvest in India was exceptionally good, but to meet a strong demand from Europe more than 18 per cent. of its total produce was exported, and prices in India rose. In 1892, inspite of a poor harvest, prices did not rise, owing to a decline in the European demand. In 1895 the Indian crops were below the normal, but out of the restricted supply a large quantity was exported to foreign countries, and prices rose. In 1901 prices were high on account of famine, but in the following year prices fell owing to a decline in the European demand. From 1904 to 1907 the production of Indian wheat was above the normal but still prices rose

(1) P. 114.

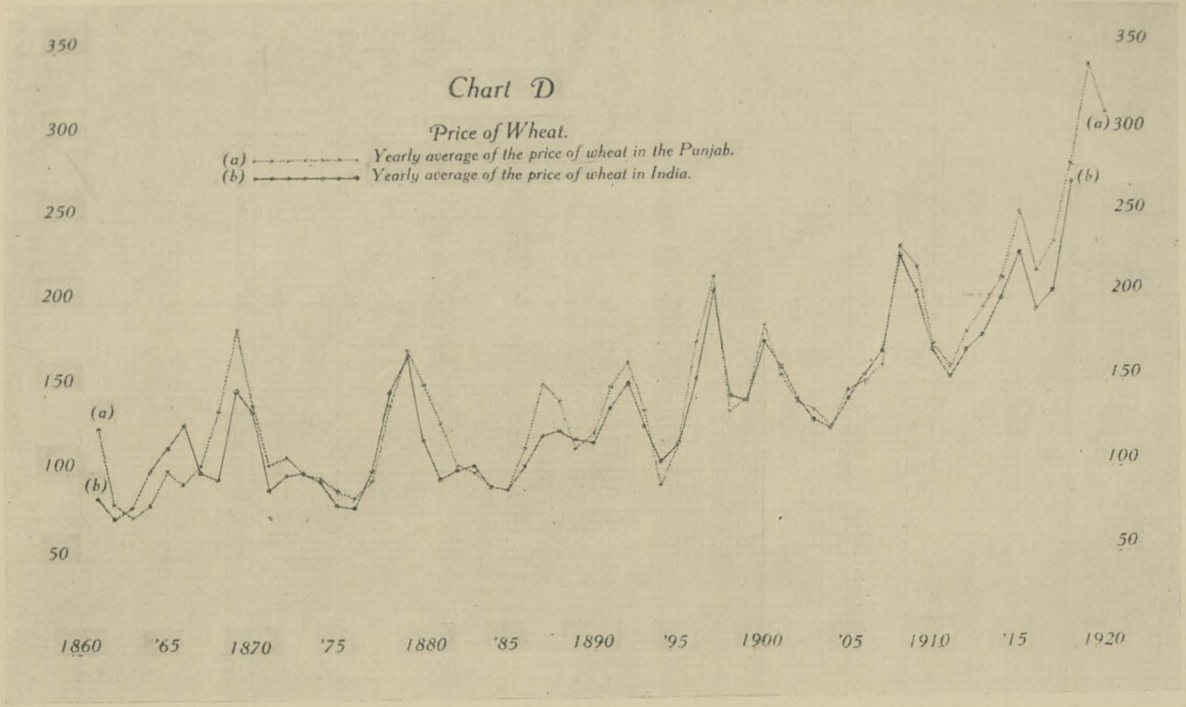


Chart D
Price of Wheat.
(a) Yearly average of the price of wheat in the Punjab.
(b) Yearly average of the price of wheat in India.
350
300
250
200
150
100
50
(a)
(b)
(a) 300
(b)
1860
'65
1870
'75
1880
'85
1890
'95
1900
'05
1910
'15
1920

steadily in sympathy with the rise in foreign prices Of the rise in prices in 1910 and the following two or three years the same explanation is to be given. " The price of wheat in India has, with some occassional falls, been rising in recent years, notwithstanding the increase in the supply available for internal consumption. This is explained by the rise in world markets."[1]

We do not, however, find a complete explanation of the great rise in the price of wheat in India since 1905 in the growth of the export trade. A new factor came into play in 1905 which overshadows other factors such as the growth of population or increased exports. This is currency inflation. As the result of inflation the general price level in India before the war rose more rapidly than prices in other countries.

The question of inflation is connected with the nature of the Indian currency system. I cannot enter here into a full discussion of the relation of the gold exchange system to Indian prices. I have discussed it elsewhere. But I am summarizing my main conclusions below :—

1. The hoarding and the melting of rupees before 1893 prevented prices from rising too rapidly by reducing the volume of the currency ; the change in the character of the rupee, from a full value coin to a token coin, by discouraging hoarding and making it unprofitable to melt rupees, contributed in some measure to the inflation of the rupee currency. It really proves nothing to say as Mr. Datta does, that " the average annual coinage during the eighteen years that have elapsed since the closing of the mints has been much less than in the corresponding period preceding that date."[2] The averages are 751 lakhs for the period 1874-75 to 1893-94, and 566 lakhs for the period 1893-94 to 1911-12. In the decade following the closing of the mints the average net coinage was small, due to a deliberate restriction of the coinage to force up exchange. If we compare the average coinage in the decade preceding the closing of the mints with that in the ten years ending 1912-13 (the great rise in our prices took place in this period), we find that the average was 808 lakhs in the earlier period and 917 lakhs in the latter. Further, in comparing such

(1) Prices Report, p. 116.

(2) Prices Report, p. 89.

averages, we should not forget that before the closing of the mints 45 to 50 per cent. of the coinage was melted and hoarded.

2. Rupees cannot be forced into circulation, but a token currency which is convertible into gold only for a limited purpose (payment of international indebtedness), even when it is not forced into circulation, tends to become inflated.

3. The stability of exchange during the period 1899 to 1914 cannot be used as an argument to show that the currency during this period was not inflated. Many instances can be given from the recent monetary history of Europe showing that while exchange remained stable, the internal purchasing power of money decreased heavily on account of inflation.

It is not denied that inflation played an important part in raising the general level of prices during the war. Indian prices rose to their highest point in 1920, the index number of wholesale prices standing at 204 as compared with United Kingdom 295, Canada 244, France 506, Italy 624, Sweden 347, Norway 377, Denmark 341, Holland 292 and United States of America 197. The discussion of the more rapid rise of prices in European countries between 1914 and 1920, and of the subsequent movements of world prices lies beyond the scope of this paper.

To facilitate discussion I have summarized below the main conclusions reached in this paper:—

The general rise of prices in India as compared with that in other countries between 1890 and 1912.

1. Prices rose to a greater extent in India than in other countries before the war. We may take as the basis of comparison average prices in the quinquennium 1890—94 or 1894—98 (the lowest level of prices in all the countries compared with the exception of India was reached in the quinquennium 1894—98), or, if a single year is taken as the base for all countries, the year 1895. If the year 1896 is taken as the base for European countries, because European prices were lowest in that year, the year 1894 must be taken as the base for India.

2. After a series of index numbers has been constructed, any year of the series may be made 100 and the index numbers for other years reduced or magnified in proportion. This procedure is justified by Fisher and is very commonly employed.

3. In order to compare the extent of the rise of prices in India with that in other countries, India's index numbers of silver prices must be converted into index numbers of gold prices. This was done by the Prices Enquiry Committee and this has also been done by the Government Department of Statistics.

Punjab Food Prices, 1841—1920.

1. Prices in 1851—60 were much lower than prices after 1860

2. Prices did not remain remarkably stable between 1861 and 1887. They were rising. This is shown by the fact that in years of plenty in the decade 1871—80 prices never fell to the level of prices in good years in the decade 1861—70. The lowest level of prices in 1881—90 was higher than that in the preceding decade, and still much higher than the lowest level reached in the decade 1861—70.

3. The failure of prices in 1871—80, and in 1881—90 to return, in years of plenty, to the lowest level of prices in 1861—70 justifies us in speaking of "a marked upward tendency" of food grain prices in the Punjab after 1861.

4. Prices continued to rise between 1887 and 1905. They were not stable between 1896 and 1905. In the first place, the famines of 1896-97 and 1899-1900 raised prices, and secondly, even if we ignore the effects of famine, the general index number stood at 130 in 1904, which is 25 points higher than the level touched in 1894 (a year of plenty), 105.

5. After 1905 prices began to rise more rapidly than they had ever done before. The period of famine prices without famine began in 1905.

6. A smoothed curve of prices is useful for showing *the general trend of prices*, but no inferences can be drawn from it regarding the rise or fall of prices in particular years. When we do so, we are confounding the general trend with short time fluctuations, and this is essentially wrong from the statistical standpoint.

7. A smoothed curve sometimes hides the significance of the original data. The original data are always more important than the smoothed curve and they must be consulted when we wish to determine the precise point of time when prices began to rise or to fall.

Causes of the rise of prices.

1. It would have been most remarkable if the general level of food prices had remained stable between 1861 and 1887, considering that the influence of the development of communications began to be felt even before 1870. The failure of prices after 1870 to return to the level of 1862—1866 was chiefly due to the development of communications as the result of which Punjab's surplus food could be exported to other parts of India and to Europe.

2. It is incomprehensible why this influence should suddenly begin to make itself felt in 1887, and not before that year. Through communication with Bombay and Calcutta was established in 1870.

3. The increase in the circulation of money and the rise in the cost of cultivation also played some part in raising prices.

4 The rise of prices since 1905 is principally due to inflation.

The price of food grains in relation to the price of cotton cloth.

A very great change has occurred in the relation between the price of food grains and the price of cotton cloth since the war, and it is worthy of note.

We may study the fluctuations in the price of cotton cloth by means of the index numbers of the Commercial Intelligence Department, articles Nos. 31, 32 and 33, (grey shirting, grey yarn, coloured yarn, orange, all imported), given on page 14 of *Index Numbers of Indian Prices, No. 996 for 1919*. The base year is 1873. It is found that between 1873 and 1910, while the index numbers rose and fell, they never rose above 100. In 1911, for the first time, grey shirtings rose to 105. The average of the index numbers of the three articles was still 100 in 1911. The index numbers for the years 1910 to 1918 are given below :—

	Grey shirtings	Grey yarn	Coloured yarn orange	Average
	Article No. 31	Article No. 32	Article No 33	
1910	96	92	88	90
1911	105	96	99	100
1912	107	83	94	95
1913	104	90	93	96
1914	103	91	98	97
1915	99	77	97	91
1916	106	108	129	114
1917	123	148	185	152
1918	199	244	283	242

It is seen that the price of cotton (manufactured) in 1914 was below the price in 1873. The rise of prices commenced in 1916, and in 1918 the price had risen 142 per cent. above that in 1873.

In 1914, however, the price of wheat was much above the level of 1873. The index number of wheat stood at 123, (average of Club No. 2, Khandwa and Delhi No. 1). Between 1914 and 1918 while the price of wheat continued to rise, it rose less than the price of cotton (manufactured). The index numbers of wheat are given below:

	Wheat. Average of Club No. 2, Khandwa and Delhi No. 1
1910	115
1911	99
1912	106
1913	109
1914	123
1915	147
1916	131
1917	134
1918	176

Unfortunately the index numbers of this series for later years were not abailable at the time of writing. The Commercial Intelligence Department, however, has constructed another series of index numbers called "Index Numbers of whole-sale Prices in Calcutta by Groups of Articles", with prices in July 1914 equal to 100. The annual averages for food grains and cotton manufactures for the years 1915 to 1924 are given below:*

	FOOD GRAINS		Cotton manufactures
	Cereals	Pulses	
1914, end of July	100	100	100
1915	115	122	97
1916	106	107	150
1917	92	96	221
1918	110	119	320
1919	63	180	319
1920	154	166	354
1921	145	160	306
1922	137	152	278
1923	114	112	268
1924	123	114	275

The greater rise in the price of cotton manufactures as compared with food grains since 1916 is clearly seen. If we constructed curves showing the fluctuations in the prices of food grains and

* Indian Trade Journal for June 12, 1925.

cotton manufactures between 1910 and 1924, the two curves will cut each other in 1916 and they will have the form of scissors; the curve of cotton manufactures will be below that of food grains till 1916 and then above it.

The index numbers given above are of wholesale prices in Calcutta, but the relation between the prices of food grains and of cotton manufactures would be the same in the Punjab.

Effects of the rise of prices.

In conclusion a few words may be said about the social significance of the great rise in the price of food grains that has occurred since 1861.

Prof. Myles's index numbers of the average price of wheat, barley, jowar, bajra and gram show that prices in 1920 had risen 186 per cent. This does not give us an adequate idea of the extent of the rise of prices since 1861. Prof. Myles's basic period is the decennium 1873—1882, and the average prices in this decennium, as I have already shown, were already 26 per cent. higher than the average prices in the quinquennium 1861—65. As compared with average prices in 1861—65 (equal to 100), prices rose to 391 in 1920, or 291 per cent. Roughly, prices as compared with 1861—65, rose four times in 1920, or the purchasing power of the rupee in terms of food grains in the Punjab was reduced to four annas in 1920.

What is the social significance of the great rise of prices that has taken place in the Punjab?

The rise in the price of food grains is generally regarded as a cause of agricultural prosperity. Some writers even go further and maintain that the income of our large agricultural population cannot be increased "otherwise than by an increase in the price of produce."* It is also obvious that the rise in the price of food grains does not benefit the urban population, and hence the view, which is sedulously encouraged by certain writers in the Punjab, that there is a conflict between urban and rural interests.

The rise in the price of agricultural produce benefits all agriculturists in the sense that they have to sell a smaller proportion of their

* Letter entitled "The Agriculturists and the Prices of Agricultural Produce" by Sardar Jogendra Singh (now Minister of Agriculture in the Punjab) in the *Tribune* of 29th August, 1922.

produce in order to pay the land revenue when prices are high than when they are low. But apart from this, the rise in the price of food grains means very little to small cultivators who produce very little more than what is required for their own consumption. The great rise in prices has enriched large cultivators who have a surplus to sell, not the small cultivators of the Punjab, Captain Dunlop-Smith, Settlement Officer, Sialkot District (1888—95), thus comments on the effects of the rise of prices on cultivators in the Sialkot District:—

"Whatever the exact percentage of the rise in prices may be, it cannot be employed in assessment calculations without considerable qualification. The majority of the landowners in Sialkot are not affected by fluctuations in the prices of food grains, except when they have to buy their seed for harvest. They require every grain they can produce for the support of themselves, their families and their cattle. Even those who have large enough holdings to afford them surplus produce, are benefited to a disproportionately small extent by a rise, those who profit being the middle men and petty traders."*

On p. 51 of my Essays on Indian Economic Problems, Part I, I have said:—

"..it may be well to remind all those who build nice theories of the prosperity of India's small farmers on very slender evidence of the views of Hassu, a small farmer (Rania village, Moga Tahsil, Ferozpur Dist. of the Punjab) who, when questioned on the subject, said:—

Main bechan tan mehngiyai da savad ae ; dane khane joge nahin honde; sanu mehngiyai da ki savad de."†

It is important to remember that the Punjab is a land of small peasant proprietors. Large cultivators form a minority of the agricultural population in the Punjab, as in other parts of India.

Those who have seen our villages and how agricultural labourers and *kamins* live, also know very well that these classes of the agricultural community have not benefited by the rise of prices. They live from hand to mouth, and in their case the rise of prices, so far from being s source of gain, is frequently a cause of indebtedness.

* Settlement Report, Sialkot Dist. (1888—95) p. 36.

† "The rise of prices would mean something to me if I had anything to sell. What I produce is not sufficient for my own consumption. The rise of prices means nothing to me".

We should not forget that the rise of prices, in the long run, must be accompanied by a rise in the cost of cultivation, and that in many cases, when profit can be made by selling agricultural produce at a high price, the mahajan, the middleman and the exporter get the lion's share of it.

The small cultivators of the Punjab, and other parts of India, are poor not because prices are low, or because they do not know which crops to grow and how to grow them. The chief causes of their poverty are two: (*a*) the constant sub-division of holdings which is continually reducing the size of the average holding, and (*b*) scattered holdings. A new era in the development of agriculture will begin when scattered holdings are consolidated and when, as our manufacturing industries develop, the proportion of the population dependent upon agriculture begins to diminish. This will be a work of time and labour, but there is no other solution of our agricultural problem. When the question is considered thus, the so-called conflict between rural and urban interests disappears, and the progress and well-being of these two sections of the population are seen to be inter-dependent.

TABLE I

Prices of Food Grains in the Punjab in seers per rupee.

Year	Wheat	Barley	Jowar	Bajra	Gram
1841	23·40				
1842	29·70				
1843	28·35				
1844	27·00				
1845	24·75				
1846	22·05				
1847	21·60				
1848	27·90				
1849	23·18				
1850	26·10				
1851	38·25				
1852	36·00				
1853	31·05				
1854	28·13				
1855	35·10				
1856	29·25				
1857	34·65				
1858	36·45				
1859	36·45				
1860	26·10				
1861	17·46	24·80	22·12	22·87	19·65
1862	26·98	45·23	36·43	32·39	33·70
1863	29·95	48·87	43·71	38·26	41·12
1864	27·49	42·51	33·30	29·20	34·77
1865	21·73	34·72	29·09	26·33	30·09
1866	22·83	35·67	29·34	24·91	30·05
1867	21·07	29·22	26·68	23·56	23·88
1868	16·24	23·59	17·81	16·52	18·80
1869	11·99	18·00	15·56	13·32	10·99
1870	15·84	23·47	23·78	19·48	16·58
1871	21·08	31·91	29·26	22·79	22·37
1872	20·40	29·78	23·57	22·60	21·20
1873	22·18	33·45	30·36	28·16	27·64
1874	22·95	33·58	27·60	24·89	32·14
1875	24·79	35·45	30·66	29·10	32·02
1876	25·97	38·42	33·24	31·04	36·67
1877	23·33	36·63	31·22	28·50	31·79
1878	16·07	24·01	16·66	15·32	16·22
1879	12·92	18·06	15·72	15·27	14·99
1880	14·59	21·70	21·23	17·93	18·13
1881	17·33	26·30	22·21	18·94	21·12
1882	21·37	34·06	30·15	24·28	26·99
1883	22·22	35·98	34·84	29·92	30·76
1884	24·37	36·22	33·08	28·69	32·22
1885	24·91	38·49	34·01	30.38	32·39
1886	19·48	32·40	25·32	21·98	28·85
1887	14·69	21·32	17·48	15·89	21·02
1888	15·62	21·53	19·45	16·57	20·52
1889	19·62	30·36	25·64	20·26	25·56
1890	18·18	27·56	24·21	21·43	22·48

Continued on next page.

TABLE I—(*continued*).

Prices of Food Grains in the Punjab in seers per rupee.

Year	Wheat	Barley	Jowar	Bajra	Gram
1891	14·91	22·49	17·75	16·32	19·80
1892	13·57	20·69	19·51	15·92	20·24
1893	16·42	26·36	24·41	19·81	25·71
1894	24·21	39·02	31·40	23·63	34·51
1895	19·10	28·68	24·40	20·56	25·17
1896	12·63	16·53	14·78	12·68	15·61
1897	10·42	13·52	11·76	10·39	10·48
1898	16·39	25 46	22·01	19·62	19·14
1899	15·76	22·16	19·75	17·09	17·35
1900	11·98	15·06	12·42	11·94	11·56
1901	15·20	23·76	21·83	20·07	18·25
1902	15·96	22·30	21·62	17·81	19·03
1903	16·42	22 86	21 88	19·82	21·06
1904	17·75	27·12	28·93	23·26	26·18
1905	15·07	23·74	21·62	18·54	20·63
1906	14·62	20·33	15·96	14·04	16·96
1907	13·78	20·36	18·67	17·11	16·35
1908	9·55	13·39	11·38	10·55	10·29
1909	10·15	16·66	15·46	14·28	13·56
1910	12·83	21·30	17·48	16·09	18·17
1911	13 87	20·60	17·86	15·74	18·74
1912	12·18	15·96	13·41	12·39	15·34
1913	11·38	15·92	15·43	12·61	14·38
1914	10·47	14·65	12·26	11·18	11·71
1915	8·80	13·77	10·66	10·22	11·70
1916	10·27	13·50	12·76	10·88	12·12
1917	9·54	13 80	12·60	13·04	11·66
1918	7·89	11·28	7·19	8·36	9·86
1919	6·50	8·96	6·56	5·60	7·02
1920	7·12	10·43	8·64	7 79	7·19

1. The price of wheat from 1841 to 1860 is "adjusted price" (see text).

2. The prices of the five food grains from 1861 to 1905 have been taken from the *Prices and Wages, 23rd Issue.* These are all averages for 21 districts.

3. The prices of the five food grains from 1906 to 1920 have been taken from the *Prices and Wages, 36th Issue.* They are given in the Report in Rupees per maund, and had to be converted into seers per rupee. For wheat and barley the prices given are averages of 23 districts and for jowar, bajra and gram, the averages of 21 districts.

TABLE II

Index Numbers of Prices. The average of prices in 1861—65 = 100.

Year	Wheat	Barley	Jowar	Bajra	Gram	Average of five grains.
1841	106					
1842	83					
1843	87					
1844	92					
1845	100					
1846	112					
1847	114					
1848	89					
1849	107					
1850	95					
1851	65					
1852	69					
1853	80					
1854	88					
1855	70					
1856	85					
1857	71					
1858	68					
1859	68					
1860	95					
1861	142	158	149	130	162	148
1862	92	87	90	81	95	89
1863	83	80	75	78	78	79
1864	90	92	99	102	92	95
1865	114	113	113	113	106	112
1866	108	110	112	120	106	111
1867	117	134	123	126	133	127
1868	152	166	185	180	170	171
1869	206	218	212	224	290	230
1870	156	167	139	153	192	161
1871	117	123	113	131	143	125
1872	121	132	139	132	150	135
1873	111	117	108	106	115	111
1874	108	117	119	120	99	113
1875	100	111	107	102	100	104
1876	95	102	99	96	87	96
1877	106	107	105	105	100	105
1878	154	163	198	194	197	181
1879	191	217	210	195	213	205
1880	169	181	155	166	176	169
1881	143	149	148	157	151	150
1882	116	115	106	123	118	116
1883	111	109	95	100	104	104
1884	101	108	100	104	99	102
1885	99	102	97	98	98	99
1886	127	121	130	136	111	125
1887	169	184	188	188	152	176
1888	158	182	169	180	155	169
1889	126	129	129	147	125	131
1890	136	142	136	139	142	139

Continued on next page.

TABLE II—(*continued.*)

Index Numbers of prices. The average of prices in 1861—65 = 100.

Year	Wheat	Barley	Jowar	Bajra	Gram	Average of five grains
1891	166	174	186	183	161	174
1892	182	190	169	187	157	177
1893	151	149	135	150	124	142
1894	102	101	105	126	92	105
1895	129	137	135	145	127	135
1896	196	237	223	235	204	219
1897	237	290	280	287	304	280
1898	151	154	150	152	167	155
1899	157	177	167	174	184	172
1900	206	260	265	249	276	251
1901	163	165	151	149	175	161
1902	155	176	152	167	168	164
1903	150	172	151	150	151	155
1904	140	145	114	128	122	130
1905	164	165	152	161	154	159
1906	169	193	206	212	188	194
1907	179	193	176	174	195	183
1908	259	293	289	283	310	287
1909	244	236	213	209	235	227
1910	193	184	188	185	175	185
1911	178	190	184	189	170	182
1912	202	246	246	241	208	229
1913	217	246	213	236	222	227
1914	236	268	269	267	272	262
1915	281	285	309	292	272	288
1916	241	291	258	274	263	265
1917	259	284	261	229	273	261
1918	313	348	458	357	323	360
1919	380	438	502	532	454	461
1920	347	376	381	409	443	391

TABLE III.

Punjab Food Prices. Moving averages.

Year	Average price of the five food grains as a percentage of their average price from 1861 to 1865.	AVERAGES.				
		Three yearly.	Five yearly.	Seven yearly.	Ten yearly *(centred.)	Twenty yearly *(centred.)
1861	148					
1862	89	105				
1863	79	88	105			
1864	95	95	97	109		
1865	112	106	105	112		
1866	111	117	125	132	131	
1867	127	136	150	144	133	
1868	171	176	160	148	136	
1869	230	187	163	152	139	
1870	161	172	164	152	139	
1871	125	140	152	149	138	134
1872	135	124	129	140	136	134
1873	111	120	118	121	136	136
1874	113	109	112	113	135	136
1875	104	104	106	121	134	136
1876	96	102	120	131	136	136
1877	105	127	138	139	136	138
1878	181	164	151	144	135	139
1879	205	185	162	146	134	137
1880	169	175	164	147	133	133
1881	150	145	149	147	134	134
1882	116	123	128	135	139	136
1883	104	107	114	124	142	138
1884	102	102	109	125	138	139
1885	99	109	121	127	133	139
1886	125	133	131	129	133	143
1887	176	157	140	134	137	151
1888	169	159	148	145	142	155
1889	131	146	158	156	144	153
1890	139	148	158	158	146	154
1891	174	163	153	148	152	157
1892	177	164	147	143	163	158
1893	142	141	147	156	168	161
1894	105	127	156	176	169	163
1895	135	153	176	173	177	165
1896	219	211	179	173	182	168
1897	280	218	192	188	180	170
1898	155	202	215	182	180	173
1899	172	193	204	200	182	178
1900	251	195	181	191	185	182
1901	161	192	181	170	185	183
1902	164	160	172	170	179	185
1903	155	150	154	173	180	188
1904	130	148	160	164	190	194
1905	159	161	164	182	189	202

Continued on next page.

TABLE III—(*continued.*)

Punjab Food Prices. Moving averages.

Year	Average price of the five food grains as a percentage of their average price from 1861 to 1865.	AVERAGES.				
		Three yearly.	Five yearly.	Seven yearly.	Ten yearly *(centred.)	Twenty yearly *(centred)
1906	194	179	191	191	187	207
1907	183	221	210	195	191	208
1908	287	232	215	202	198	212
1909	227	233	213	212	208	225
1910	185	198	222	217	221	235
1911	182	199	210	227	231	
1912	229	213	217	229	239	
1913	227	239	238	234	246	
1914	262	259	254	245	262	
1915	288	272	261	270	284	
1916	265	271	287	307		
1917	261	293	327	327		
1918	360	361	348			
1919	461	404				
1920	391					

* Centred by means of a two-yearly moving average

TABLE IV

Price of Wheat. Moving averages.

Year.	Price of wheat as a percentage of the average price in 1861—65.	Averages.	
		Ten yearly *(centred).	Twenty yearly *(centred).
1841	106		
1842	83		
1843	87		
1844	92		
1845	100		
1846	112	97	
1847	114	94	
1848	89	93	
1849	107	92	
1850	95	91	
1851	65	88	88
1852	69	84	89
1853	80	81	90
1854	88	78	89
1855	70	76	90
1856	85	80	90
1857	71	85	90
1858	68	86	92
1859	68	87	96
1860	95	89	100
1861	142	92	103
1862	92	96	105
1863	83	102	107
1864	90	113	109
1865	114	123	110
1866	108	125	111
1867	117	125	112
1868	152	128	115
1869	206	130	120
1870	156	131	125
1871	117	129	127
1872	121	128	128
1873	111	128	129
1874	108	127	130
1875	100	127	130
1876	95	129	130
1877	106	130	132
1878	154	130	133
1879	191	129	131
1880	169	129	129

Continued on next page

TABLE IV—(*continued.*)

Price of wheat. Moving averages.

Year.	Price of wheat as a percentage of the average price in 1861—65.	Averages.	
		Ten yearly *(centred).	Twenty yearly *(centred).
1881	143	130	129
1882	116	135	132
1883	111	138	135
1884	101	135	135
1885	99	130	136
1886	127	130	139
1887	169	134	145
1888	158	140	148
1889	126	142	147
1890	136	143	147
1891	166	148	149
1892	182	155	150
1893	151	158	152
1894	102	159	154
1895	129	164	157
1896	196	168	159
1897	237	166	161
1898	151	165	164
1899	157	167	169
1900	206	170	173
1901	163	171	175
1902	155	167	176
1903	150	169	178
1904	140	179	183
1905	164	183	190
1906	169	183	195
1907	179	186	197
1908	259	191	202
1909	244	200	211
1910	193	210	220
1911	178	220	
1912	202	227	
1913	217	234	
1914	236	244	
1915	281	258	
1916	241		
1917	259		
1918	313		
1919	380		
1920	347		

* Centred by means of a two-yearly moving average.

TABLE V

Prof. Myles's Index Numbers of Punjab Food Grain Prices

Year	Average price of wheat, barley, bajra, jowar and gram as a percentage of their average price from 1873 to 1882.	AVERAGES.		
		Ten yearly.	Fifteen yearly.	Twenty yearly * (centred).
1	2	3	4	5
1861	109			
1862	67			
1863	59			
1864	71			
1865	83	98		
1866	83	96		
1867	94	100		
1868	126	102	94	
1869	169	103	92	
1870	119	103	93	
1871	93	102	98	100
1872	100	100	103	100
1873	82	101	106	101
1874	84	99	108	102
1875	77	100	107	102
1876	72	101	104	101
1877	78	102	98	102
1878	134	100	95	103
1879	151	99	95	101
1880	125	99	97	99
1881	111	101	100	100
1882	86	106	100	101
1883	78	105	102	103
1884	77		106	103

Continued on next page.

TABLE V—(*continued.*)

Prof. Myles's Inaex Numbers of Punjab Food Grain Prices.

Year	Average price vf wheat, barley, bajra, jowar and gram as a percentage of their average urice from 1873 to 1882.	AVERAGES.		
		Ten yearly	Fifteen yearly.	Twenty yearly * (centred).
1	1	3	4	5
		99		
1885	74		109	103
		97		
1886	93		107	106
		99		
1887	130		103	112
		103		
1888	124		101	114
		106		
1889	97		104	113
		106		
1890	103		112	114
		109		
1891	128		115	116
		115		
1892	130		118	117
		123		
1893	105		125	118
		122		
1894	78		127	120
		125		
1895	99		126	121
		133		
1896	161		126	124
		132		
1897	205		125	125
		131		
1898	114		126	127
		132		
1899	126		127	130
		134		
1900	184		127	133
		135		
1901	118		134	134
		133		
1902	120		140	135
		126		
1903	115		143	138
		136		
1904	95		141	142
		140		
1905	117		138	148
		135		
1906	141		142	151
		136		

Continued on next page.

TABLE V—*(continued.)*

Prof. Myles's Index Numbers of Punjab Food Grain Prices.

Year.	Average price of wheat, barley, bajra, jowar and gram as a percentage of their average price from 1873 to 1882.	AVERAGES. Ten yearly.	Fifteen yearly.	Twenty yearly * (centred).
1	2	3	4	5
1907	133		146	152
		141		
1908	209		148	155
		146		
1909	166		153	164
		156		
1910	135		158	172
		165		
1911	133		167	
		170		
1912	167		183	
		176		
1913	166		195	
		182		
1914	191			
		199		
1915	210			
		214		
1916	194			
1917	191			
1918	263			
1919	336			
1920	286			

* Centred by means of a two-yearly moving average.

TABLE VI

Punjab Food Prices (in seers per rupee).*

Year	Wheat	Adjusted † price.	Gram	Barley	Jowar
1841	26	23·40	29	36	41
1842	33	29·70	38½	44½	37½
1843	31½	28·35	37½	45½	43½
1844	30	27·00	37	43½	37½
1845	27	24·75	34	38½	37½
1846	24½	22·05	28	34	31¼
1847	24	21·60	29½	34	35
1848	31	27·90	32½	39	28¼
1849	25¾	23·18	24¼	33	31½
1850	29	26·10	35	45	41
1851	42½	38·25	50	61½	51
1852	40	36·00	44¼	56	51
1853	34½	31·05	49	52	39¼
1854	31¼	28·13	40¼	45½	44½
1855	39	35·10	56½	59	57½
1856	32½	29·25	47	50½	51½
1857	38½	34·65	51½	55	51
1858	40½	36·45	53	58	52
1859	40½	36·45	49¾	60	48¼
1860	29	26·10	33	40	30½

* Taken from the diagrams given in the Punjab Administration Report for 1874-75.

† Adjusted by reducing the figures given in the previous column by 10 per cent. in each case (see text).

TABLE VII

Index-Numbers of the retail price of wheat.
Price in 1873 equal to 100.

Year	Index Nos. for India of the Commercial Intelligence Department	Author's Index Numbers for the Punjab.
1861	86	127
1862	73	82
1863	80	74
1864	102	81
1865	115	102
1866	129	93
1867	101	105
1868	96	137
1869	148	185
1870	136	140
1871	90	105
1872	98	109
1873	100	100
1874	94	97
1875	81	89
1876	78	85
1877	102	95
1878	147	138
1879	158	172
1880	118	152
1881	96	128
1882	101	104
1883	103	100
1884	91	91
1885	89	89
1886	103	114
1887	121	151
1888	123	142
1889	118	113
1890	117	122

Continued on next page.

TABLE VII—(*continued.*)

Index Numbers of the retail price of wheat.
Price in 1873 equal to 100.

Year	Index Nos. for India of the Commercial Intelligence Department	Author's Index Numbers for the Punjab.
1891	137	149
1892	151	163
1893	127	135
1894	105	92
1895	116	116
1896	153	176
1897	206	213
1898	143	135
1899	140	141
1900	176	185
1901	160	156
1902	142	139
1903	129	135
1904	123	125
1905	142	147
1906	155	151
1907	168	161
1908	226	232
1909	203	219
1910	170	173
1911	153	160
1912	170	182
1913	177	195
1914	200	212
1915	227	252
1916	193	216
1917	205	233
1918	270	281
1919	..	340
1920	..	312